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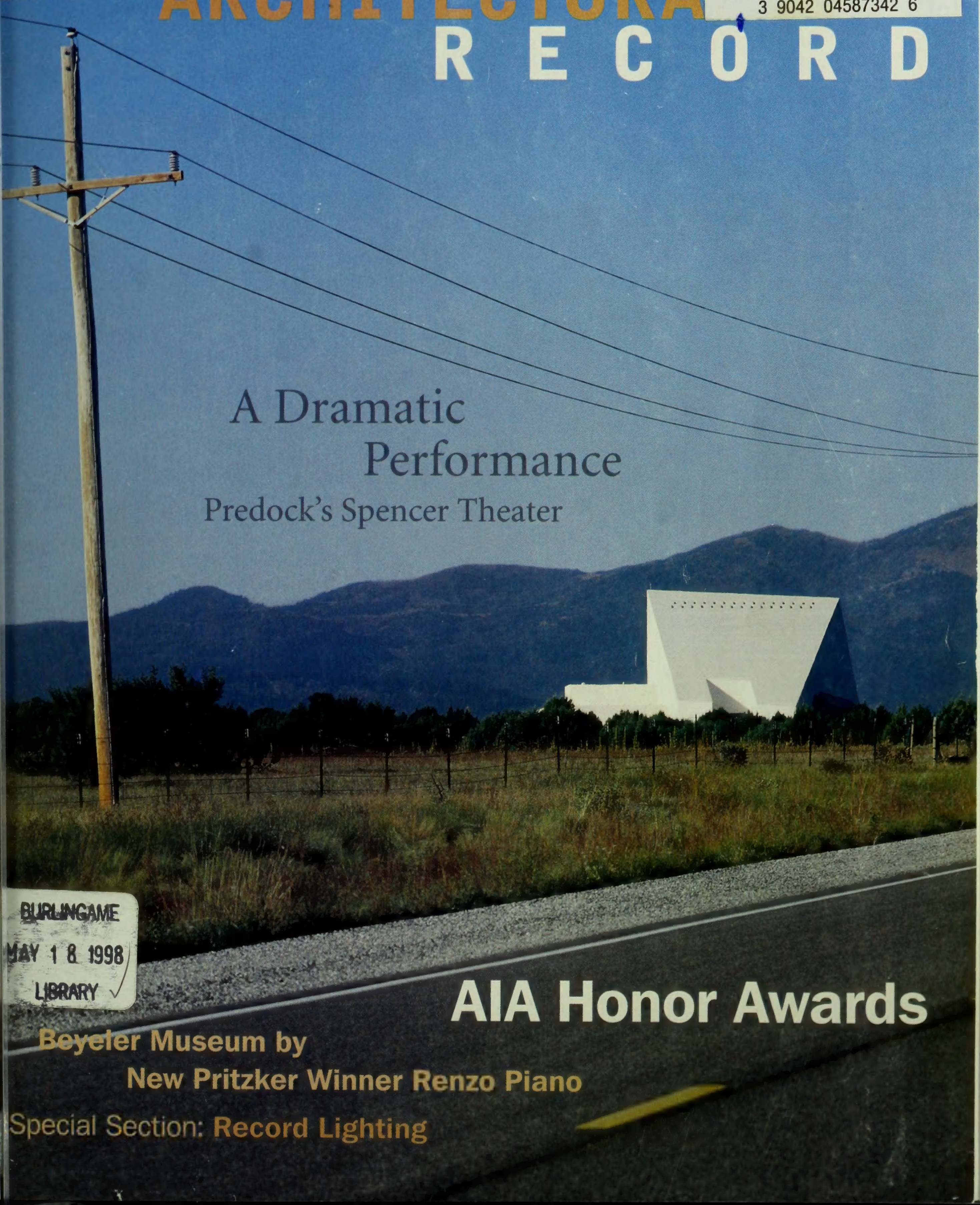

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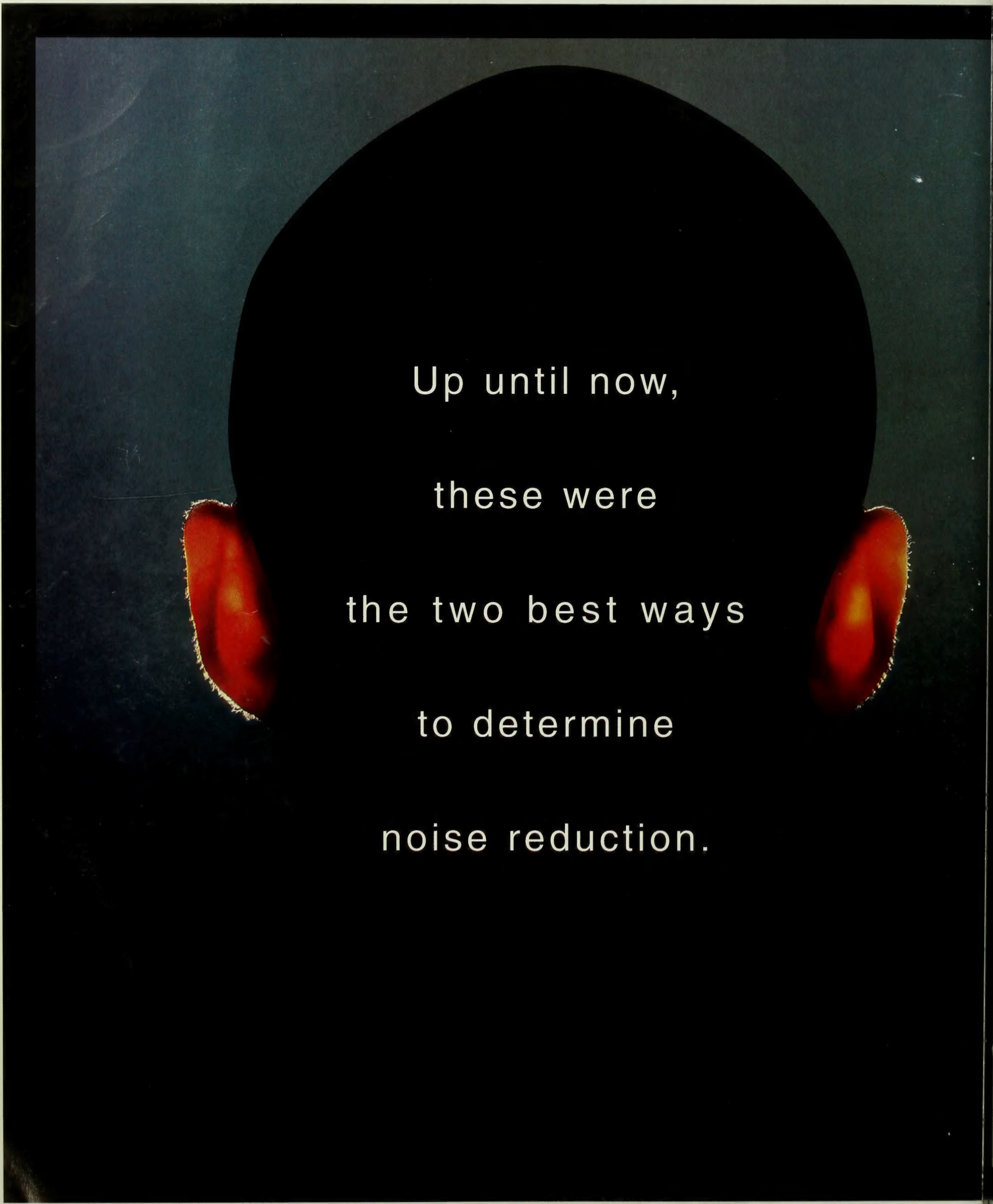
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**Cover:** *Spencer Theater for the Performing Arts, Ruidoso, New Mexico. Antoine Predock Architect. Photo © Timothy Hursley.* **Above:** *Beyeler Museum, Basel, Switzerland. Renzo Piano Building Workshop. Photo © Christian Richters.*

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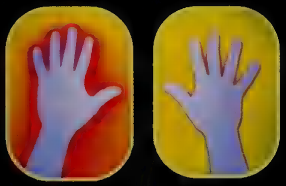

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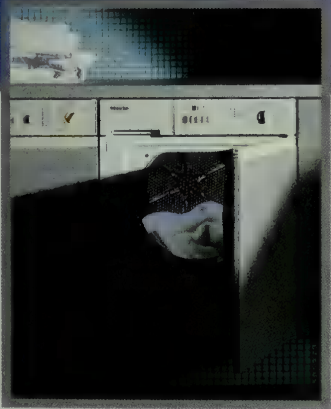

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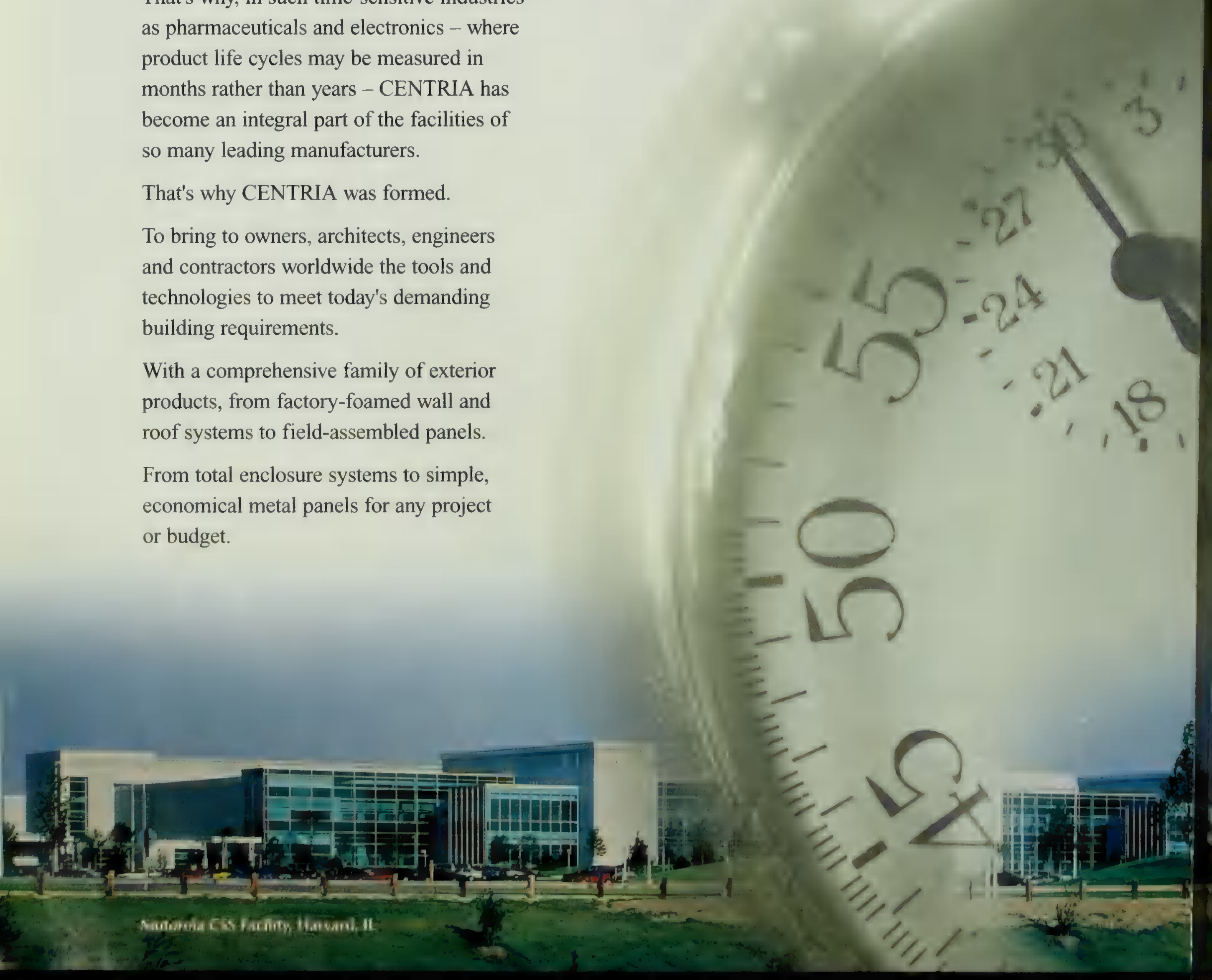

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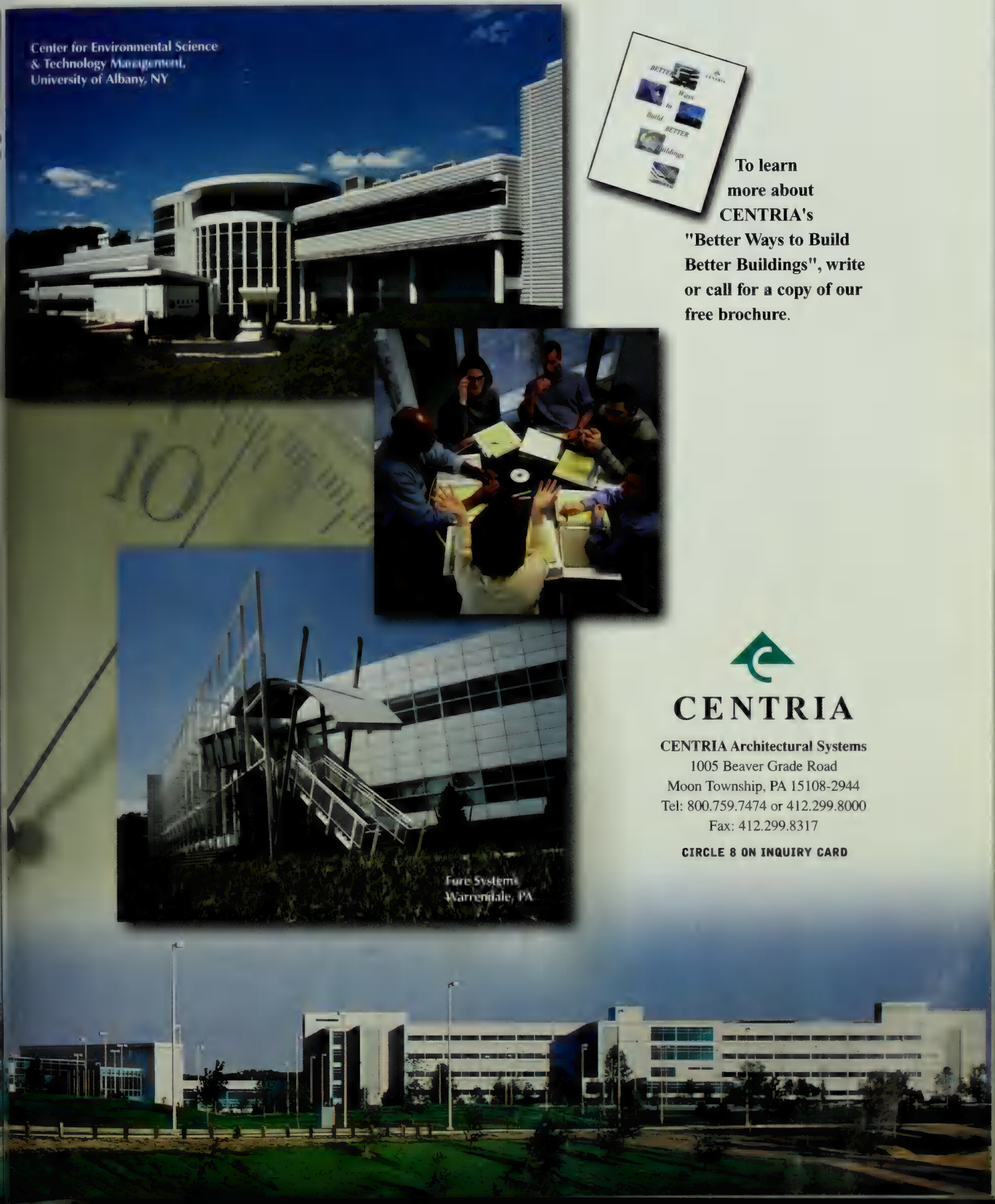

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CIRCLE 10 ON INQUIRY CARD

# EDITORIAL

# The iconic American building

### BY ROBERT A. IVY, FAIA

*It has been a spring of violent storms. As television cameras have panned across the country, exposing mud slides, scoured houses, and twisted trees—the detritus of clashing weather fronts—a singular building crops up in scene after scene: the public school. In the aftermath of torrential California rains or Alabama tornadoes, it is the school building that often serves as backdrop for the interview with survivors, since it continues to serve a central role as physical shelter and community center. The traditional anchor for the development of our citizens, the public school is arguably the fundamental, iconic American building type.*

*President Clinton has suggested a fund with billions of dollars to assist with school construction. His program is sane, balanced, and necessary: he proposes assisting 5,000 schools over a five-year period by paying the interest on bonds issued to states and municipalities. The anticipated law rises above partisanship and intrastate squabbling by allowing local initiative and encouraging local construction where it is needed most. Every architect should be able to support this model legislation.*

*Why? Elementary and secondary schools comprise a bedrock component of architectural practice. Schools constitute a healthy sector of the construction economy, accounting for over $12 billion of completed work in 1997, involving all our skills for planning, new construction, additions, and renovations. What architect, what firm has not participated in their advancement?*

*When critics accuse architects of being apolitical, concerned only with the niceties of design, they fail to recognize how school work is inevitably politicized, a fractious arena where architects find themselves at the center of clashing points of view. When architects gather, as they are convening this month in San Francisco, war stories from school board meetings abound. Parent meetings and bond-issue gatherings sometimes turn into passionate forums of debate as taxpayers argue vehemently the merits and costs of architects' proposals. Architects are often on the firing line, called on to build consensus to achieve approved plans: since we are so vitally involved, we cannot help but care about the outcome.*

*Despite national economic health, architects know from experience that too many school districts are clinging to poor facilities because of inadequate resources. While bad buildings can come from incomplete maintenance programs, inept or corrupt management, the culprit is often property taxes, which undergird the system and can perpetuate inequity. Too often we observe significant disparity between facilities. We inspect older buildings with leaking roofs and worn floors, with uninspired double-loaded corridors that stretch toward no horizon; we visit playgrounds with trampled earth and broken equipment that suggest anything but play. Rich districts inevitably build and maintain better schools; dirt-poor districts, whether urban or rural, sometimes fail to provide the minimum standard of care. They cannot afford the basics.*

*Building schools is something architects know how to do. Given the resources, we can help provide sheltering, creative, cost-effective learning environments: resource centers and classrooms that stimulate the mind; buildings that instill pride, self-worth, and a sense of ownership for students, teachers, and administrators; and whole campuses that bolster community development and declare the centrality of education in our democracy.*

*The president is calling for infrastructure building of a high order. Regardless of your political affiliation, as an architect you understand the need to create proper foundations of buildings and of people. You have the skills and contacts and a vested interest in the outcome. Exercise your considerable influence for our collective future. This is a moment and a chance for the architect's voice to be heard. The skies are continuing to rumble.*

Robert Ivy

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– Graham Davidson, architect

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CONTINUING EDUCATION AIA

CIRCLE 11 ON INQUIRY CARD

Terminal A parking garage at
National Airport in Washington, D.C.
Architect of record: HNTB Corporation
esign architects: Hartman-Cox Architects
Graham Davidson, FAIA

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# LETTERS

### Mixed-use Main Street

I was somewhat dismayed to see that the three projects featured in your otherwise stimulating article "Main Street Goes Suburban" [March, page 123] all lacked the key ingredient that makes Main Street so appealing, namely mixed use. Dismayed but not surprised, since increasing specialization today within both the profession and the development community makes mixed-use projects the exception rather than the rule.

Main Street is retail driven, and all too often retail tenants (specifically larger national tenants who need to be wooed by developers to ensure that a project can go ahead) end up calling the shots. Unless real estate prices or specific land-use requirements dictate otherwise, you will be hard pressed to find either a retail tenant or a developer willing to consider putting offices or apartments above a new store, given the ensuing lack of flexibility and the perceived added competition for parking.

Changing entrenched mentalities is a long and arduous task and requires a combination of favorable market forces, a local jurisdiction with a clear vision of what they want their community to be, an enlightened developer, and a committed architect capable of maneuvering through the complex politics of such an endeavor. Until this happens more regularly, I fear that we will see many more articles like yours: an encouraging premise but disappointing results.

*—Yann E. Taylor, AIA*
*Field Paoli Architects*
*San Francisco*

### Interior design and safety

After reading your editorial in the February issue of RECORD ["A Building Lasts a Lifetime," page 13], I felt I had to respond. By asserting that only architects are in a position to have a synergistic view of building safety, you are showing your inexperience with the entire design profession. As an interior designer for more than 20 years, I can assure you that it is our business to manage life-safety issues on a daily basis.

Knowledgeable and experienced architects who have the opportunity to observe the successful results of the work of interior designers can and will prove you incorrect.

*—Marla Bommarito-Crouch, ASID, IIDA*
*Graeber, Simmons & Cowan*
*Austin, Tex.*

### Soul provider

I gave your article "Listening to Interior Designers" [April, page 66] to a recent residential client of mine to get his opinion about his experience with me versus his interior designer. His reaction was "Well, she [the interior designer] did design a place for our underwear to go, but you designed a place for our souls. And that is the most wonderful thing of all about the house."

*—Dennis Michael Findley*
*McLean, Va.*

### Accessible? Yes. Easy? No.

Your news item "Wheelchair Ramp Drives Renovation of New School Courtyard" [March, page 46] shows a stunning plan view of a ramp that "flows down from the deck" in a "radical curve" around a fountain.

While a curving ramp may tickle the fancy of the designers, most wheelchair users have great difficulty negotiating a narrow, curving pathway because it requires the wheels of the chair to be rotated at different speeds. Driving a chair up a ramp is difficult enough, but adding the requirement that you must simultaneously turn your left side wheel 30 percent faster than your right side wheel is asking a lot. Perhaps the designers should have "embraced the access requirement" a little tighter and spent a little of the project's $2.6 million budget on research.

*—Carl Mezoff, AIA*
*Stamford, Conn.*

### Architects and contractors

"Listening to Contractors" in your February issue [page 54] was very timely, informative, and stimulating for this architect who has worked the past 14 years as a consultant on complex and costly construction litigation. It is relatively easy to identify problems—few can doubt that the architect's construction documents have declined in quality and completeness—but solutions are difficult.

I am troubled that so many people—the GSA, developers, contractors, and especially architects—have opted for design-build without recognizing the limitations of this approach to construction. Andrea Oppenheimer Dean's article only reinforces my conviction that design-build deserves far more skepticism and analysis than its proponents appear to grant.

*—Ellis Kaplan*
*Kaplan McLaughlin Diaz*
*Bolinas, Calif.*

### Practicing prudence

Your March editorial, "Prudence in Good Times" [page 15], makes some excellent points, especially regarding "valuable strategic planning" for architects. However, your premise that "our collective economic life in the construction universe follows a sine curve like a powerful wave" does not have to apply to architecture firms.

In our management consulting experience, design firms that organize themselves around select client types gain a superior understanding of their clients' needs and issues. This makes them more responsive and more cost-effective, which translates into being more competitive and more profitable. Also, their focused knowledge allows them to advise their clients, rather than take orders from clients who think *they* know best. The best client-driven architecture firms are paid for their knowledge, not their CADD systems.

*—Raymond F. Kogan, AIA*
*Zweig White & Associates, Inc.*
*Washington, D.C.*

### AIA award for adaptive reuse?

The adaptive reuse award as proposed by Malcolm Holzman [February, page 18] is worthy of serious consideration by the AIA. These projects must overcome significant economic handicaps while meeting unique contextual guidelines. They must serve the present and respect the past. These buildings frequently impart a special sense of place to a community, a sense that is often ignored in favor of "progress."

Our roots do not have to be our relics...or our endangered species.

*—Henry Eng, AICP*
*Honolulu*

I would like to suggest another category in the AIA Awards program: details. Awarding outstanding design detailing on buildings would send the correct message to the general public that architecture is a complex and highly technical field. Good design is also the result of good detailing. Witness the detailing of I. M. Pei's Louvre addition. Let's see a contractor detail that.

*—Howard L. Filiere Jr., NCARB*
*The Architects Incorporated*
*Cleveland*

### More on VSBA

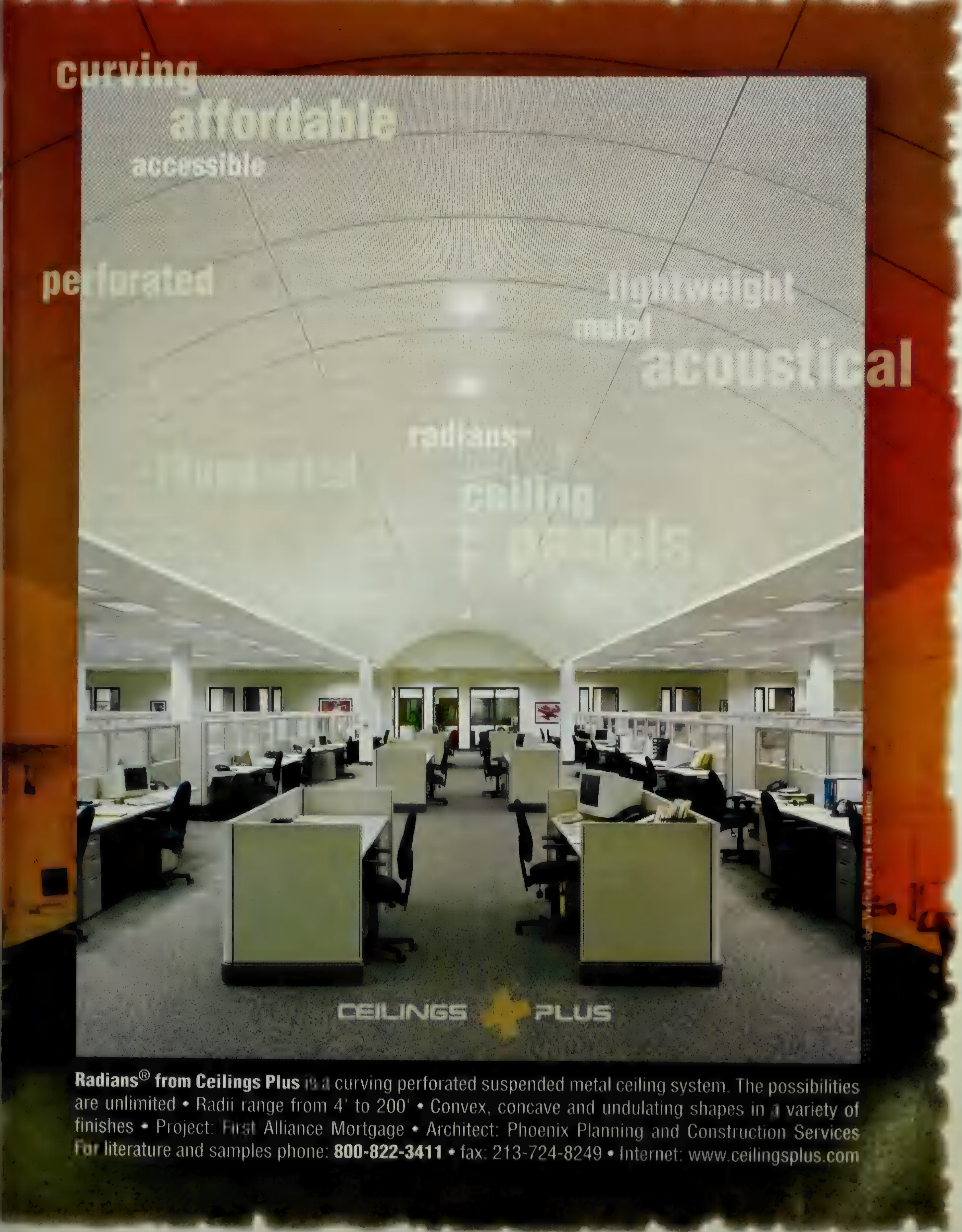
Venturi Scott Brown and Associates ["VSBA Today," February, page 58] is almost alone in continuing the project of Modernism—engaging in an artistically unpreconceived way the real conditions of contemporary society, construction, and culture.

That they have found Rome, art history, and unmodern moderns such as Lutyens helpful has confused even admirers. In some ways it would have been better if they hadn't written about it. They might never have been credited with unleashing Postmodernism, a charge comparable to calling Thomas Edison the father of disco.

*—Robert L. Miller, AIA*
*Washington, D.C.*

It may interest you to learn that there were many of us here in Staten Island who supported both

*(continued on page 22)*



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CIRCLE 12 ON INQUIRY CARD

*(continued from page 20)*

of VSBA's designs for the Whitehall Terminal, but we never had the chance to make our support known. I myself—a lifelong resident of Staten Island and a daily commuter by ferry to Manhattan—wrote more than 50 letters to various government officials and civic groups, and handed out leaflets in the St. George Terminal. The silence of members of the New York architecture community—for example, I asked, in vain, members of Columbia University's architecture and art history faculties to write letters of support—was pathetically noticeable and would make a story in itself.

*—Richard William Hayes, RA*
*Staten Island, N.Y.*

**Koolhaas at IIT**

Rem Koolhaas suggests the inclusion of Mies's Commons Building under the roof of his campus center [March, page 37]. Such chutzpah! This is almost as nutty as the idea, of a few years back, to enclose the Parthenon.

Architecture, by definition, must embrace the real world of change over time such as the effects of climate and weather, the physical context, and vandalism. At best, a work of architecture might become, at some future date, a fine ruin. Alas, such a romantic notion pretty much evaporated with the demise of stone construction.

*—James A. Gresham, FAIA*
*Tucson, Ariz.*

**Slavery museum**

Creating a national slavery museum is a great idea [March, page 20]. It would be a natural companion to the Holocaust Memorial Museum. The museums help us to remember that slavery and genocide are part of our past. By remembering these horrors of the past, we can keep them from being part of the present and future.

*—Susan Greenwald, FAIA*
*Chicago*

**Marketing expanded services**

"America's Best-Managed Firms: How to Succeed with Expanded Services" [January, page 50] points out the benefits of architects offering clients a wide array of services but provides little advice about how to identify and sell these services.

Apart from reorganizing how services are presented, the new Owner/Architect Agreement (B141-1997) offers two major opportunities for identifying and selling expanded services. First, it requires owners and architects to identify major project objectives and parameters (physical constraints, schedule and financial parameters, program requirements, etc.). From an active discussion of these issues, architects can segue into discussing how their expertise can help owners tackle each of their objectives.

Second, article 2.8.3 prompts a dialogue about possible expanded services. While not exhaustive, the matrix of services invites both owners and architects to discuss their capacity and willingness to provide the myriad administrative and technical tasks required. Architects can expand this matrix to include their full range of capabilities, from project definition to facility move-in and management. This not only broadens the architect's thinking, it also shows owners how architects can help navigate the labyrinth of project tasks and decisions.

Now that the B141 has evolved to a point where it can be used as a marketing tool, the architect's ability to broaden his project role has been considerably strengthened.

*—Michael Strogoff*
*Mill Valley, Calif.*

**Modernist spec house**

The lesson learned from "Making a Spec House Special" [April, page 70] was not that high design is an option for speculative housing, as the article implies. It's that high design *costs*. Hire an architect, lose money.

YOU THINK YOU HAVE THE COLD HARD FACTS.

Your choices are limited. The budget can't support your imagination. The future looks exactly like the past.

The most important programmatic requirement for a spec house is to make a profit for the client/builder, to add value that can be perceived and appreciated in an open market. If there's no market for Postmodernism in the land of the colonial, then don't build it!

Is it any wonder that architects have been shut out of the spec housing arena?

*—Todd Hotchkiss, AIA*
*Des Moines*

**Criticism crit**

This is simply an enthusiastic fan letter about "Assessing the State of Architectural Criticism in Today's Press" [March, page 64]. What a thoughtful, comprehensive, interesting, lively, well-written, accurate piece!

I was particularly affected by the last sentence: "The next step should be trying to place architecture…in the larger social and political picture." This gets directly at the chief frustration of existing written understandings of architecture, that they are so hermetic and hence make architecture out to be something ultimately so unimportant.

*—Paul Spencer Byard, FAIA*
*Platt Byard Dovell*
*New York City*

The vast majority of practicing architects are (as forced by the market) producing more inclusive work, yet the magazines obsess about a few projects that are, on the surface, modern looking even if not especially relevant or responsive.

A certain amount of this is to be expected from journals that cater to the young and the easily influenced. But where does it lead? Do you really want to see a Bilbao sprouting up next to a gas station in Lincoln, Illinois? Will this help the average American get through his or her day? Will this contribute to the bettering of our world, country, town?

Eye-candy projects produced on lavish Hollywood budgets are not relevant to the usual business of architecture.

*—Ethan Anthony*
*HDB Architects*
*Boston*

**Credits/corrections**

The review of a new Fumihiko Maki monograph in the March issue (page 27) incorrectly identified the book's graphic designer; it was Kijuro Yahagi. Ricardo Legorreta's name was misspelled in the review of his monograph.

Lawrence Weschler's and Miriam Gusevich's names were spelled incorrectly in "Assessing the State of Architectural Criticism in Today's Press" (March, page 64).

The March article on the Rocky Ridge Town Center (page 134) should have identified Kalwall, one of the materials used in the project, as translucent fiberglass reinforced composite glazing.

On page 159 of the March New Products section, Kaswell Flooring Systems' FibreBlock was misidentified as FireBlock.

In "VSBA Today" (February, page 58), the New York firm of Anderson/Schwartz should have been credited as a partner with Venturi Scott Brown and Associates in the design of the Whitehall Ferry Terminal. The firm has continued with the project since VSBA's resignation.

In a February story on Salt Lake Hardware (page 126), John Williams was identified as the developer of the Metropolitan restaurant. Although Mr. Williams once owned the property, the developer of the Metropolitan was Christophe Olson.

*Letters may be E-mailed by visiting our Web site at www.archrecord.com and clicking on News/Features/Dialogue. RECORD may edit letters for grammar, style, and length, taking care not to change the meaning.*

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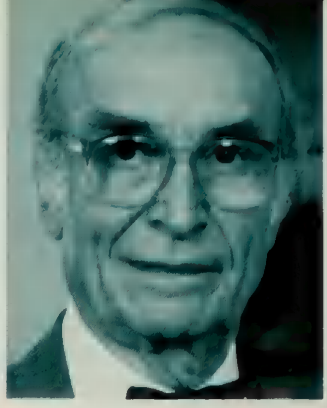
CIRCLE 13 ON INQUIRY CARD

# SPEAK OUT It's time we recognize the unique contributions of the executive architect.



### GEORGE M. WHITE, FAIA

*George M. White, FAIA, vice chairman of Leo A. Daly, is a registered architect, a professional engineer, and a member of the bar. A graduate of Harvard's business school, he is the former Architect of the Capitol.*

One of the primary goals of architecture is to bring beauty into the environment. Architects harness the power of form to enhance the human experience through structures. But if giving a building its identity—designing—is a job only architects can do, it is just one of many that they perform.

The architect's task used to be simple: design all aspects of a house or building. But about 100 years ago, technological innovations began to increase the rate of change in the construction industry. The advent of hot-water heating systems, elevators, and electric lighting, for example, meant that the engineering of even simple construction projects became increasingly complicated.

Suddenly, installing plumbing was no longer a matter of digging a pit in the backyard. As the scope of architecture expanded, its practitioners had to become increasingly specialized—to master one aspect of construction—a development that led to the formalization of the engineering professions.

In recent years, as clients have built ever larger projects with complex systems, the practice of architecture has evolved even further. Large firms, especially, are called on for services that would boggle the gentleman architect's mind, like financial feasibility studies, construction and program management, and design-build.

"One-stop shopping," or purchasing a broad range of services from one firm (whether the firm provides them all itself or farms out selected jobs), has pushed architecture in new directions, and industry's ethics and standards are evolving with it.

Architects are the only professionals whose interests and expertise encompass the entire spectrum of design and construction issues. In addition to being creative designers, they are synthesizers, coordinators, financial analysts, business executives, cost controllers, and managers of other professionals and of construction projects. But in response to the increasingly complex demands of their medium, architects too have become specialized within their field.

The executive architect, who is ultimately responsible for making a project happen, must be on top of every aspect of its design and construction. Consider the awesome responsibility of realizing Dulles Airport, for example. Then consider that designer Eero Saarinen's name is the only one linked to it in the public record.

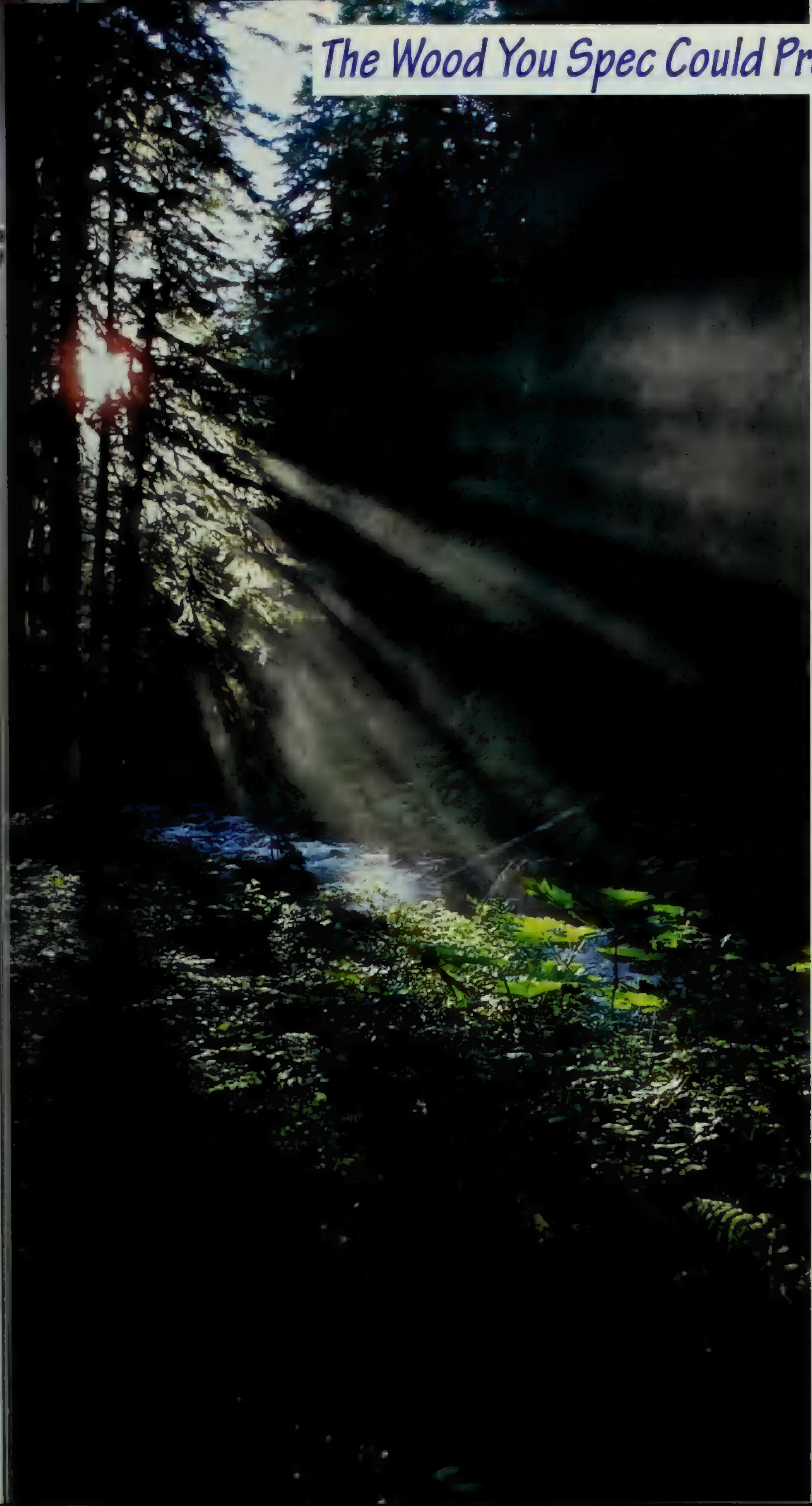
Because the executive architect's work is managerial in nature, there's no "beauty" in a job well done. Unlike the design of a facade or tower, which makes an instant impact, the essential contribution of executive architects—who are by far the vast majority of practicing professionals—is unlikely to garner attention.

The profession itself—and the architectural press—has been slow to recognize that design expertise has its counterparts in the other aspects of practice. The Gold Medal, the American Institute of Architects' highest individual award, is given to a "signature" architect each year for excellence in design. But where is the recognition of executive architects? The AIA board of directors' recent democratization of the selection process for the Gold Medal and the Firm Award may offer an opportunity to honor them.

In addition to awards, the executive architect could benefit from more press. A picture of a building is the graphical equivalent of a 20-second sound bite, which necessarily leaves out much more than it reveals. What we need to know, especially in the case of technical marvels like Frank O. Gehry's Guggenheim Bilbao, is the rest of the story.

Without in any way diminishing the work of celebrated designers, why not recognize the architect who delivers a project—whose talents are as valuable and as difficult to come across as those of a first-rate designer? Thousands of architects are solving the myriad problems associated with the design and construction of society's shelter every day. Let's sing the praises of these as yet unsung heroes, as well as for those at the forefront of design. ■

**Contributions:** *If you would like to express your opinion in this column, please send submissions by mail (with a disk, if possible) to Speak Out, Architectural Record, 1221 Avenue of the Americas, New York, N.Y. 10020; by fax to 212/512-4256; or by E-mail to soren_larson@mcgraw-hill.com. Essays must not exceed 700 words. The editors reserve the right to edit for space and clarity. Where substantial editing occurs, the author will receive final text approval.*



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*AR 4/98* **CIRCLE 14 ON INQUIRY CARD**

# MENTORS One engineer discusses the new discipline of building commissioning, and another offers a primer for new project architects.

*David Houghton, P.E., is president of the consulting engineering firm Resource Engineering Group, in Boulder, Colorado.*

*Andy Covington, P.E., is an electrical engineer with CRS, a consulting engineering firm with offices in Jackson, Mississippi, and Birmingham and Mobile, Alabama.*

*ARCHITECTURAL RECORD asked David Houghton, P.E., to discuss a new trend, building commissioning, which helps ensure that new buildings work as intended.*

There's a lot of talk these days about building commissioning. What is it? Like evaluating a ship's seaworthiness before it sails, the commissioning process thoroughly inspects and aggressively tests commercial and institutional buildings to see that their systems are functioning well. Commissioning ensures that buyers get buildings that actually work—a feat that grows more difficult each year as increasingly complex systems seem to invite error into every phase of project development.

Systems that benefit from commissioning include HVAC, lighting, building automation, energy management, fire protection, security, and communications. Although saving energy isn't always the primary goal of commissioning, it is often a very tangible benefit.

New buildings are not always commissioned. In many cases, the owner and the design team rely on contractors to determine that they've met the specifications for system operation. But this method doesn't always produce the desired results. Construction managers tend to pay more attention to budgets, schedules, and materials than the intricacies of building controls; inspectors are mostly concerned with life-safety issues; and designers are usually knee-deep in their next projects by the time final punch lists are being tackled.

Who does commissioning, and how much does it cost? A new breed of specialists, known as commissioning coordinators, is helping bring major construction projects to successful completion. These people, often former facility operators or controls contractors, tend to be good communicators with a broad knowledge of building systems. Rather than cast blame, they try to improve everyone's understanding of how things are supposed to work and who is responsible for what. (Getting people to work together can be as challenging as getting equipment to work together.) Over the past several years, building commissioning has become a small but established industry with its own annual conferences and an emerging professional association.

Commissioning coordinators begin their work in the design phase, verifying that the design team's intent is clearly communicated to the builders. They develop tests to put the building through its paces and make sure contractors know that final payments depend on passing them. They oversee the tests and certify that everything works—or help solve the problems that arise. Finally, commissioning coordinators help prepare accurate operation and maintenance documents and train building operators.

Commissioning costs upwards of $1 per square foot, depending on a building's size and complexity. Energy savings often quickly recover the cost, and there are the added benefits of happy occupants, reduced maintenance costs, and averted haggling and finger-pointing.

In a recently constructed commercial building, the mechanical engineer specified a variable-speed drive for a large supply fan. The owner paid several thousand dollars for the device, which performs better and costs less to operate than constant-speed fans. The contractor installed it and claimed it was working properly—after all, the fan blew air, and the LEDs on the drive panel blinked convincingly.

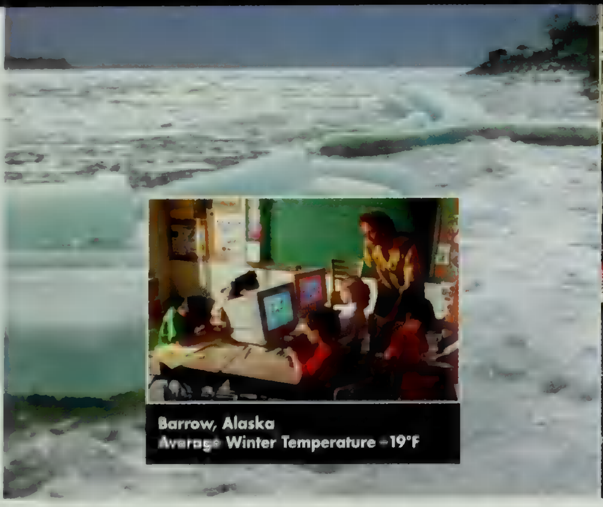
However, when commissioning agents measured the fan's input and output, they discovered that it was running 24 hours a day. They looked into the problem and found a simple programming error. A quick fix enabled the drive to do its job, but without the scrutiny of commissioning, the problem might have gone undetected for years and wasted the owner's investment.

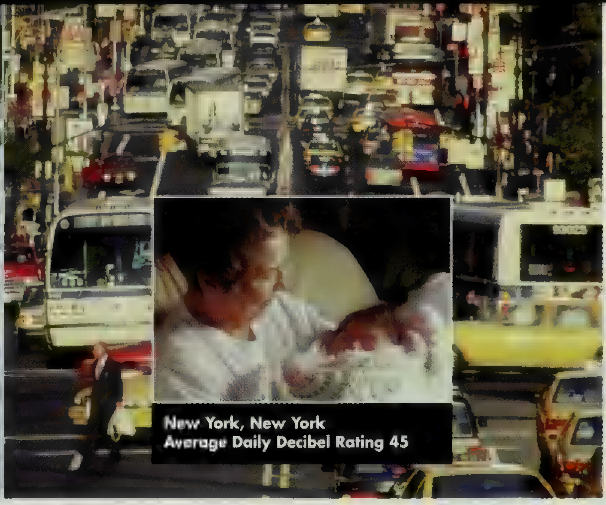
Can existing buildings be commissioned? Yes, although it's harder to investigate systems that have been modified over the years. Even so, a recent study of 44 buildings showed that commissioning existing buildings cost 5 to 40 cents per square foot and usually resulted in energy savings that repaid the commissioning costs in less than a year.

Although the intricacies of mechanical, electrical, and communications systems are the domain of engineering specialists, the architect has overall responsibility for the owner's interests in a successful project. In a world where projects are ever more complex and flawless operation is the exception rather than the rule, commissioning is a welcome antidote for Murphy's law.

*(continued on page 354)*

# When The Great Outdoors Makes Life Challenging...


Barrow, Alaska
Average Winter Temperature -19°F


New York, New York
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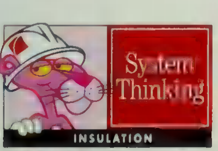

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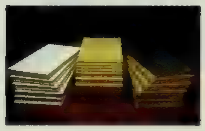

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CIRCLE 15 ON INQUIRY CARD

# PULSE RECORD readers were asked: Does the increasing concentration of architectural services within large firms benefit architects and their clients?

**No:** Because of their size, it's a matter of fact that large architecture firms can provide many more services than smaller ones. But no extra resources can make up for the lack of innovation that tends to characterize the designs of large firms. And perhaps the greatest thing a firm can offer—a principal's involvement with projects and clients—is another service that the heavy hitters often can't provide.
*—Tammy Goldberg*
*Cisneros Design Studio*
*Houston, Tex.*

**No:** Difficulties with services are encountered at both ends of the scale. However, with smaller firms, the client is usually dealing directly with a principal, which tends to improve the quality of service and the client's confidence level. There is unquestionably a "critical mass" with regard to numbers and diversity that will ensure the highest quality of service; but when a firm gets so large that important decisions regarding service are made by accountants or lawyers or both, there is no doubt that the client suffers. We have witnessed many incidents of the latter.
*—Gordon H. Rutherford, AIA*
*Director of Facilities Planning*
*University of North Carolina at Chapel Hill*
*Chapel Hill, N.C.*

**No:** Large firms may have plenty of the resources, but they don't often have the appropriate experience to perform well on small-scale projects and still provide their clients with personal service and good value.
*—Miles Yanick*
*Bainbridge Island, Wash.*

**No:** Architecture practices are following the same trend as most other sectors of the American economy. The result will be the same: less diversity in the marketplace and therefore less choice for the client.
*—Richard Clarke, AIA*
*Leo A Daly*
*Washington, D.C.*

**No:** There is no inherent advantage in being a big firm. Clients are still discriminating enough to want the very best from the architects they hire. No matter how many services a firm provides, they have to be *good* services. What's more, providing more services doesn't translate to real savings for the client.
*—Robert G. Packard III, AIA*
*Managing Partner*
*Zimmer Gunsul Frasca Partnership*
*Portland, Oreg.*

**Yes:** Absolutely, if the firms are integrated and coordinated, and offer a single point of contact for the client.
*—James M. Stevenson, FAIA*
*Perkins & Will*
*Chicago*

**Yes:** Having so many services under one umbrella rescues the client from the headache and expense of coordinating a flock of consultants.
*—Lynne Barnard*
*Associate V.P., Entertainment*
*RTKL Associates*
*Baltimore*

**Yes:** Because we're a big firm, there is collaboration, not a dictatorship of one famous person. We benefit by picking up cues from each other.
*—Peter Pran, AIA*
*Design Principal, NBBJ*
*Seattle*

**This Month's Question**

## Should interior designers be licensed?

Interior designers are currently attempting to achieve licensure at the state level through their associations. Title laws for certification are now in effect in 15 states, but licensure implies practice regulation. Only two states—Florida and Nevada—currently have existing practice laws. It is the stated policy of the American Institute of Architects that interior designers should not be licensed and that licensing is not the appropriate form of state regulation.

**Should interior designers be licensed?** ☐ Yes ☐ No

Copy and fax this form to 212/512-4256; or to respond by E-mail, visit our Web site at www.archrecord.com and click on News/Features/Dialogue.

*Note: The Pulse poll reflects a tabulation of individual responses to each month's question and is not intended to be construed as formal research.*

**Let us know your opinion:**

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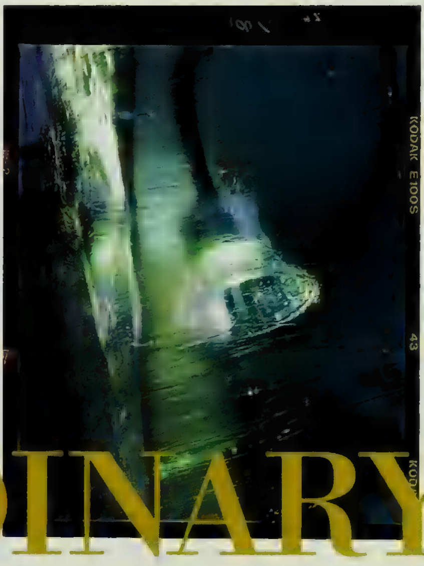

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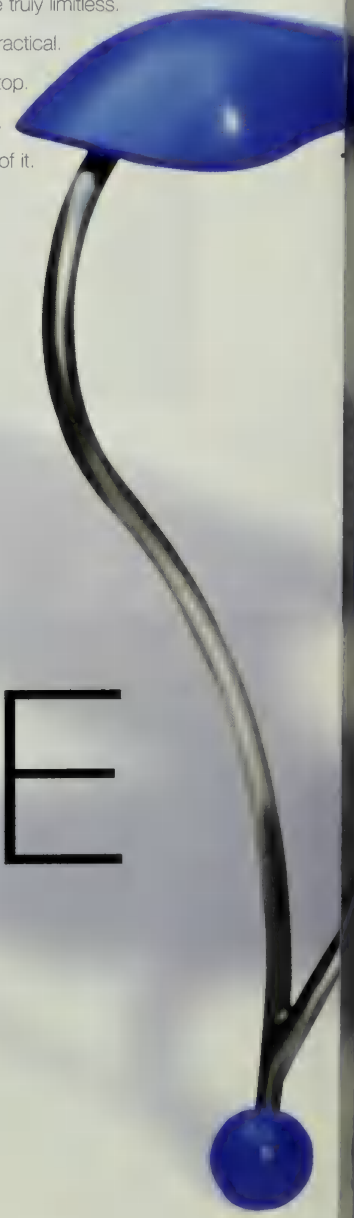

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**CIRCLE 18 ON INQUIRY CARD**

# BOOKS A spring roundup of recent publications includes topics ranging from architecture and destruction to Louis Kahn's love life.

**Radical Reconstruction,** *by Lebbeus Woods. New York: Princeton Architectural Press, 1997, 168 pages, $45.*

Sarajevo, Havana, and San Francisco are ground zero for Lebbeus Woods's latest assault on architecture-as-usual. Grouping these places together sets off creative sparks in the book's three essays. Additional light and heat are provided by the author's provocative drawings—obsessively detailed, aggressively executed renderings of worlds torn apart and then stitched back together in fantastical ways. Morbid yet vibrant, these startling images are like an adrenaline rush to the reader's architectural imagination.

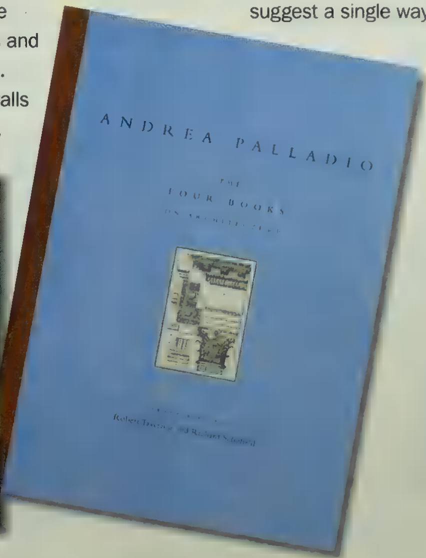
Drawn to "peripheries and edges," which "are always to some degree neglected or at the limits of control from centers of authority," Woods made numerous trips to Sarajevo during and after the recent siege by Bosnian Serbs. Doing research and running design charrettes with local architects and students while bombs were still falling, Woods developed several approaches for rebuilding pieces of the shattered city. These approaches, which Woods dubs "injection," "scab," "scar," and "new tissue," add layers of new construction and meaning to the remnants of the damaged past, ensuring that Sarajevo's tortured history is not forgotten or lost.

In Havana, Woods was attracted to another kind of destruction—that caused by neglect and decay in the wake of the U.S. embargo of Cuba and the failed economic policies of the Castro regime. Having participated in a conference in Havana sponsored by MAK (Austria Museum of Applied Arts) in 1995, Woods drew up a proposal for building an artificial terrace/seawall that would be a new urban edge for the Malecón, the six-kilometer-long boulevard that runs along Havana's waterfront. He also proposed a new "urban wall" for the edge of the old city—a veritable beehive of ad hoc uses and makeshift construction. Indeed, the theme of walls runs through this book, connected to the author's fascination with borders and edges.

In San Francisco, Woods examined radical responses to the ever-present threat of earthquakes. Instead of seismically reinforcing existing buildings that rely mostly on orthogonal frames, he investigated new kinds of structures that might actually trigger "microquakes in order that 'the big one' is defused." The result is, according to the author, "an architecture that inhabits earthquakes, existing in *their* space and time."

While Woods's powerful drawings grab the reader's eye first, his provocative text deserves attention too. Dense but clearly structured, the essay is a call to arms, a plea for architects to get involved in the world around them. Explaining the work shown in the book, he writes, "this does not mean to establish a new architectural style, or to aestheticize violence, and even less to suggest a single way of approaching the problems at hand, but rather to link the highest level of formal concerns in architecture with the most difficult social conditions."

Woods also explains why architects who are not lured to places of destruction might pick up this book. "By confronting the extreme conditions brought about by willful destruction, particularly as it affects urban life and its structures, architects will learn much about the practice of architecture within stable conditions, which they will never learn by unquestioningly accepting the often illusory appearances and assumptions of stability." *Clifford Pearson*



**Andrea Palladio: The Four Books on Architecture,** *translated by Robert Tavernor and Richard Schofield. Cambridge, Mass.: MIT Press, 1997, 436 pages, $50.*

Andrea Palladio's *I quattro libri dell'architettura* (The Four Books on Architecture) is an important Renaissance treatise, conjuring classical images from the Tuscan order and ancient Roman basilicas. First published in Italian in 1570, the work was translated into English by Isaac Ware in 1738. For 250 years Ware's translation was the only English version available.

Now British professors Robert Tavernor and Richard Schofield have translated the original text into modern English and provided an introduction with information on Palladio's life and his writings. Also included are a glossary of technical terms and a bibliography of recent

Palladio research. The result is a much more accessible Palladio. *Elana Frankel*

**Contemporary Native American Architecture: Cultural Regeneration and Creativity,** *by Carol Herselle Krinsky. New York: Oxford University Press, 1997, 277 pages, $45, $30 (paper).*

Krinsky's book records contemporary Native American architecture, from ceremonial roundhouses to pueblo-style schools to adobe stuccoed homes, as it relates to the Native American cultural regeneration that started in the 1960s and continues to this day. The text, illustrated by black-and-white photographs, places the architecture in its historical, social, political, and economic context. Krinsky covers both governmental efforts to help formulate a modern architectural movement as well as some rare private attempts to do so. Most of the buildings are small and located off the beaten path on remote reservations, and most have been neglected by the architectural press ...until now. *E.F.*

**Architects and the City: Holabird & Roche of Chicago, 1880–1918,** *by Robert Bruegmann. Chicago: University of Chicago Press, 1997, 560 pages, $65.*

Over the past 15 years, Robert Bruegmann, with help from many other individuals and institutions, has been painstakingly documenting the work of the Chicago architectural firm Holabird & Roche. In this first volume, Bruegmann, a professor of architectural history at the University of Illinois in Chicago, has not only successfully catalogued the architects' various commercial buildings and houses but has also proved that in researching architecture, urban history must also be considered. The firm's remarkable impact on the city's architecture and the surrounding areas, the fabric that makes up an urban landscape, should be of great interest to historians, no matter what their title or field. *E.F.*

**Chairman: Rolf Fehlbaum,** *by Tibor Kalman. New York: Princeton Architectural Press, 1997, 592 pages, $35.*

Rolf Fehlbaum is obsessed with chairs; indeed, he's crazy for them. So says a new book by Tibor Kalman. In a whimsical, poetic, and primarily pictorial chronology (the text is children's-book spare and basic enough to be read without translation by people around the world), Kalman presents a global history of chairs—from humble milking stools to the electric chair—that reaches nearly mythic proportions.

Simultaneously, we learn the story of how Fehlbaum, chairman of Vitra, the internationally renowned Swiss furniture company, developed his collaborations with leading architects like Tadao Ando, Zaha Hadid, and Charles and Ray Eames, who designed the first chairs produced by Vitra.

Along with co-designer Kim Maley, Kalman filled this thick little book with 650 images of Fehlbaum's favorite people and things, including, of course, Vitra's famous chair collection, which is contained in its museum in Weil am Rhein, Germany, designed by Frank Gehry. Kalman, who was the founding editor of *Colors* magazine and head of his own multidisciplinary design group M&Co. in New York City, has created a book evocative of jazz and Jim Jarmusch films, which Fehlbaum apparently loves. *Christine Liotta*

**Toward a Simpler Way of Life: The Arts & Crafts Architects of California,** *edited by Robert Winter. Berkeley: University of California Press, 1997, 310 pages, $45.*

In a spirit similar to that of the pre-Raphaelite artists of the mid-19th century, who deplored the current state of painting and sought to evoke the sincerity of a previous era, the architects of the California Arts and Crafts movement drew on the decorative themes of English Tudor, Swiss chalet, Japanese temple, and Spanish mission. Their houses were designed to complement rather than compete with nature, as evidenced, for instance, by the copious use of their favorite building material: wood.

Summoning an earlier time, before modern industry and technology transformed the practice and style of architecture, the movement, which flourished between 1890 and 1930, represented a conscious retreat from the overt materialism and commercialism of American culture. Featuring works by the movement's most notable architects, including Charles and Henry Greene, Bernard Maybeck, and Julia Morgan, this book also reveals the influence that the Arts and Crafts aesthetic continues to exert on architects working today. *C.L.*

**Civic Realism,** *by Peter G. Rowe. Cambridge, Mass.: MIT Press, 1997, 241 pages, $30.*

Peter G. Rowe, who is a professor of architecture and urban design as well as dean of the faculty of design at Harvard, is a true urbanist. In this book, he closely examines the form, appearance, and value of civic places and the cultural, political, and social forces that create them.

Rowe analyzes the circumstances that paved the way for suburbia as we know it (single-family houses, shopping centers, workplaces, and highways) and balances this with observations on some great civic places that have stood the test of time, such as the Piazza de Campo in Siena, Italy.

Most of his examples are more modern: recent public spaces in Barcelona, several of the *grand projets* in Paris, and New York's Central Park as well as other transformations of the Manhattan grid. Ultimately, Rowe is fascinated with the question of what makes a civic space, which belongs to everyone yet no one in particular, great.

What the places described in his book have in common is not so much their architectural features, but the activities that take place

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inside them. Not just for architects and urban planners, this book should interest all citizens concerned with developing a cohesive, feasible vision of a sustainable civic future. *C.L.*

**Polychromie architecturale: Le Corbusier's Color Keyboards from 1931 and 1959.** *Basel: Birkhäuser, 1997, 173 pages, plus two color charts, $180 (3 volumes in slipcase).*

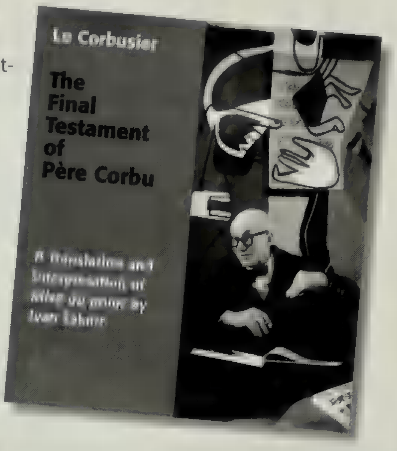
White is probably the "color" most commonly associated with the work of Le Corbusier. Think of the chapel of Notre-Dame-du-Haut in Ronchamp or the Villa Savoye or the monastery of La Tourette, and color is probably the last thing that comes to mind. Indeed, Le Corbusier's most famous text, *Towards a New Architecture* (1923), contains not a single reference to color in architecture.

But as this set of books reminds us, Corb, who was also a painter, was a master colorist. And his use of color could be as powerful as his floor plans or his palette of materials. Since his work has been primarily reproduced in black and white, it comes as a shock to see how liberally he used color, as on the facade of the Unité d'Habitation in Marseilles.

The first volume of this three-part set features full-color photos and an accessible text (in English, German, and French) by Arthur Rüegg, a Corbusier specialist who teaches in Switzerland at the ETH Zurich.

The second presents fabrications of colored wallpaper that Corbusier designed. Each page is a lush field of color, ranging from pale earth tones to acidic greens to vibrant ultramarine.

A third volume presents Corb's "color keyboard," a system he invented for the application of color. Each page represents a "color mood" and contains pattern cards with shades of color arranged in sequences for clients to choose for walls, woodwork, doors, and other details. This beautifully slipcased edition is a fascinating study in the architect's little-known purist color theory. *C.L.*


Le Corbusier
The Final Testament of Père Corbu
A translation and interpretation of Mise au point by Ivan Zaknic

**Le Corbusier: The Final Testament of Père Corbu,** *a translation and interpretation of* Mise au point *by Ivan Zaknic. New Haven: Yale University Press, 1997, 192 pages, $25.*

More than a translation, this homage to Le Corbusier by Lehigh University architecture professor Ivan Zaknic is a strange piece of work. Zaknic provides the original text to Le Corbusier's autobiographical reflections, *Mise au point*, and aptly renders it into English.

However, the author provides some strange background information for understanding the text. For example, is it necessary to cite (in painful detail) the exact coordinates of the two men swimming nearby when Le Corbusier had a seizure and died in 1965? And the exact steps they took to drag his body out of the water? And must readers see the view of the Mediterranean from the Cap-Martin cemetery where Le Corbusier and his wife Yvonne are buried, with an arrow pointing to the location where the architect took his final swim? I think not. *E.F.*

*(continued on page 38)*

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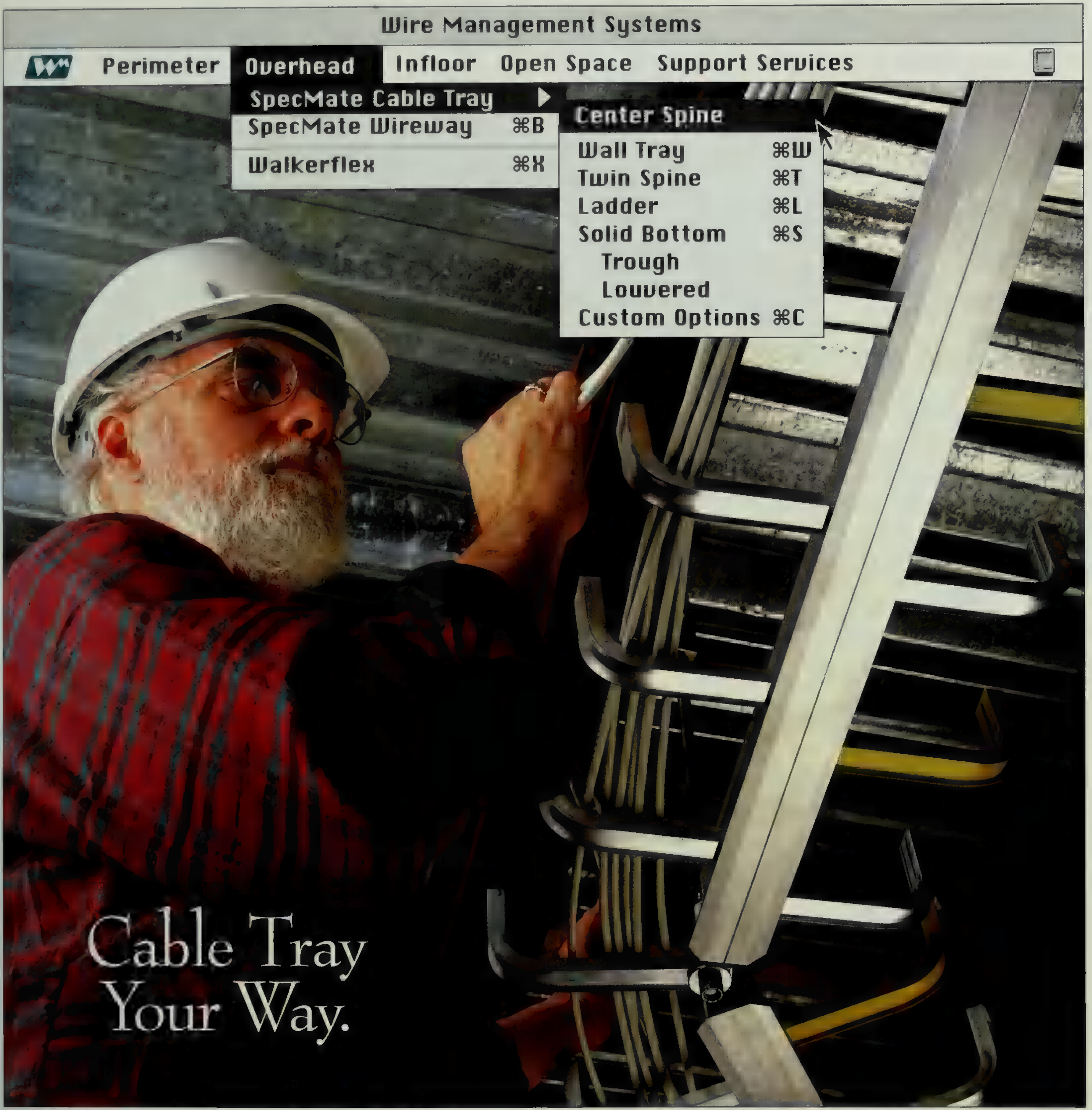

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(continued from page 36)

**Herman Hertzberger,** *by Herman van Bergeijk. Basel: Birkhäuser, 1997, 216 pages, $35 (paperback).*

Born in Amsterdam in 1932, Herman Hertzberger is one of Europe's most influential contemporary architects but is not as well known in America. The majority of his progressive designs, which include schools, theaters, and housing for the elderly, have been built in the Netherlands, and nearly all invite a great deal of social participation from the people who use them.

The only book devoted exclusively to Hertzberger, this paperback volume offers a concise and complete presentation of the architect's work to date. It includes all his important buildings and projects, from his earliest works in the 1960s to his most recent, like the Chassi Theater in Breda, Holland. This theater's dynamic undulating roofline, which Hertzberger split in two, resembles rolling ocean waves and serves as the primary facade of the building.

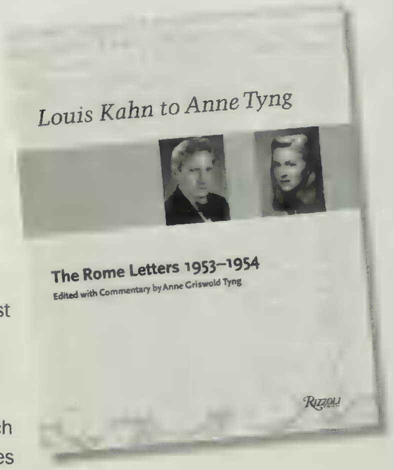
The book's text is presented in both English and German, and its clear and simple language should satisfy both lay and professional readers. *C.L.*

**The Illustrated Room: 20th Century Interior Design Rendering,** *by Vilma Barr and Dani Antman. New York: McGraw-Hill, 1997, 272 pages, $70.*

Focusing on interior and architectural rendering as a unique and evolving 20th-century art form, this book presents a comprehensive survey of styles, media, and projects—from vibrant pen-and-ink sketches of interiors to computer-generated elevations.

Organized by decade and, further, by type of interior within each chapter, the book examines Art Deco, Art Nouveau, Arts and Crafts, and other movements as they pertain to interior rendering. Highlighted are drawings by Wright, Mies, Le Corbusier, and Hugh Ferriss, one of the century's greatest architectural delineators.

Representing the most up-to-date collection of information and illustrations in the trade, and with a special section that is devoted to the future of the renderer's art in the computer age, this book promises to be an invaluable reference tool for architects, interior designers, renderers, and design students. *C.L.*


Louis Kahn to Anne Tyng
The Rome Letters 1953–1954
Edited with Commentary by Anne Griswold Tyng
Rizzoli

**Louis Kahn to Anne Tyng: The Rome Letters 1953–1954,** *edited with commentary by Anne Griswold Tyng. New York: Rizzoli, 1998, 224 pages, $45, $30 (paper).*

There is little doubt that Anne Tyng was Louis Kahn's professional muse and lover for almost a decade. But when she left for Rome in 1953, alone and pregnant, there was much question as to her own future.

The recent publication of 53 of Kahn's never-before-seen letters to Tyng in 1953–54, the time she spent in Rome, proves that in addition to their romance there was a mutual professional respect. The informal correspondence reflects a dual passion for architecture and design and bears witness to one woman's pioneering effort in a male-dominated architectural world. *E.F.*

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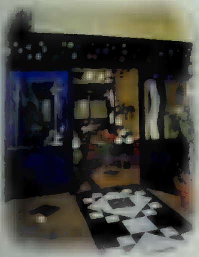

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# EXHIBITIONS Two exhibitions—a Shiro Kuramata retrospective and a survey of recent public buildings—focus on innovative Japanese design.

**Shiro Kuramata, 1934–1991**
Grey Art Gallery and Study Center, New York University, New York. *Through May 2.* Musée des Arts Décoratifs, Montreal. *June 3–September 7.*

**Japan 2000: Architecture for the Japanese Public**
Art Institute of Chicago. *Through May 3.*

## Shiro Kuramata, 1934–1991

The Japanese furniture and interior designer Shiro Kuramata is revered for having pushed the experimental envelope to create original forms, materials, and environments—or combinations of all three. During his 28-year career, this metaphysical magician's best stunts included glow-in-the-dark tables, draped fabric solidified into walls, and feathers frozen in acrylic, beyond the reach of gravity. He also worked extensively with fashion designer Issey Miyake, designing his boutiques all over the world. Kuramata's furniture and interiors have had a tremendous influence on a generation of designers in Japan, although his work is less well known here.

Incorporating the defining themes of Kuramata's career was the challenge faced by architects Michael Morris and Yoshiko Sato in their installation for the exhibition "Shiro Kuramata, 1934–1991," which was on view at New York University's Grey Art Gallery. Sato worked with Kuramata as a student intern in 1987, and she drew on that experience in her design for the retrospective.

Kuramata's unique vision was an unapologetic hybrid of cultural contradictions. In many respects, he was very Japanese. He insisted on precise craftsmanship; he was fascinated with duality, which can be seen as an extension of *wabi-sabi* aesthetic and moral values (the beauty of things imperfect, impermanent, incomplete, unconventional); and in his work he seemed to be striving for a kind of Buddhist nothingness.

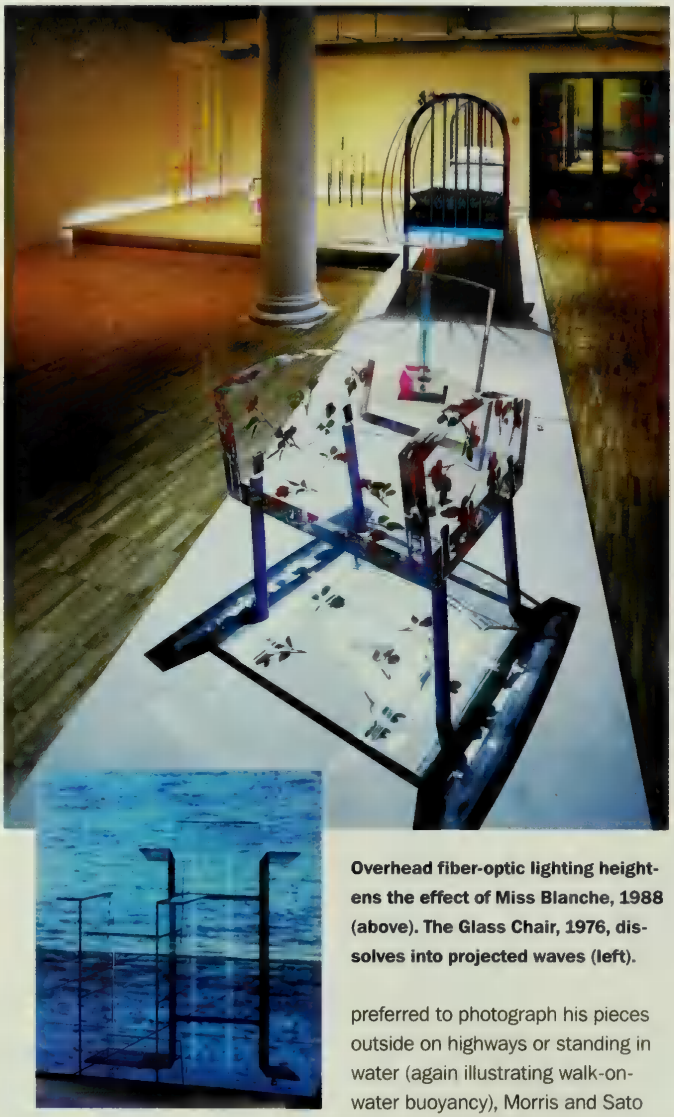
However, Kuramata grew up in postwar Japan, where the United States' invasion never ended, culturally speaking. While he may have felt some ambivalence toward America, he embraced the culture's big-band music, its emphasis on planned obsolescence, its casual irreverence, and its slick pop imagery. Kuramata adored Western magazines and Surrealist art, especially Duchamp's work. American films and music provided him with evocative titles for many of his furniture pieces: Miss Blanche, Blue Champagne, How High the Moon.

For Kuramata, functionality and practicality were not the only priorities. "The ideal is to have things float in the air without any support," he said in 1973, "like the chairs and musical instruments floating in the blue sky in Magritte's paintings.

*Victoria C. Rowan is a writer based in New York City.*

*Cheryl Kent writes about architecture and urban affairs from Chicago.*

**Installation view of "Shiro Kuramata, 1934–1991," with Lamp (Oba-Q), 1972, in the foreground and 01 Chair, 1979, at left.**



**Overhead fiber-optic lighting heightens the effect of Miss Blanche, 1988 (above). The Glass Chair, 1976, dissolves into projected waves (left).**

That is the best. From there, design begins to evolve." This concept became a major design departure point for Morris and Sato's installation. Most of the display platforms were constructed with deep reveals, the supports hidden from view so they appear to hover just above the floor.

Morris and Sato took advantage of the Grey's large, free-flowing loft space. Visitors could determine their own traffic patterns through the exhibition, viewing objects in whatever order they chose. Because the architects knew that Kuramata created his furniture for sculptural punctuation within his dramatic commercial interiors, and that he preferred to photograph his pieces outside on highways or standing in water (again illustrating walk-on-water buoyancy), Morris and Sato chose to present the works as icons-in-the-round. For the main platform in the gallery, they simulated a reflecting pool, covering the surface with a glass laminate that has stainless-steel film sandwiched within it.

Kuramata was also preoccupied with light, shadow, and the evocative quality of materials. Recognizing that Kuramata's negatives (shadows) were just as important as the positives (the furniture), Morris and Sato generated stark shadows on many of the pieces with powerful cones of light emanating from the ceiling. The result is a spectacular flattened abstract image, an effect that is particularly striking with such chairs as Begin the Beguine—a steel armature in the shape of a bentwood Josef Hoffman chair, which Kuramata ceremonially burnt out from within—and the Miss Blanche chair, with its kitschy plastic roses suspended in acrylic.

Morris and Sato also realized, however, that some pieces would look best lit from lightboxes below. At the gallery's entrance, visitors are greeted by the ghostly apparition of How High the Moon, a metal-mesh club chair that appears to be upholstered with an intricate weave of shadows. The same treatment is used with Pyramid Furniture, a tall Plexiglass chest whose seams carry the light like a visible electric current and whose black plastic drawers seem to have given gravity the slip.

Kuramata examined aspects of translucency and transparency throughout his career, whether working with acrylic, glass, or wire mesh. Morris and Sato take advantage of Kuramata's tweaking of preconceived notions in pieces like the Glass Chair, which has been described as a see-through Rietveld. In the exhibition the chair is displayed against a video projection of an oceanscape. The transparent chair panels tease the eyes into doubting what they're seeing as the furniture dissolves into the rhythmic waves.

The predominant tone of Morris and Sato's design is one of sympathetic respect for Kuramata's work. The gallery's preexisting spatial conditions are deliberately minimal, and the installation's white walls, colorless lighting, and metallic glass laminate create an environment that allows Kuramata's pieces to stand out.

At the Montreal Musée des Arts Décoratifs, where the exhibition opens on June 3, Morris and Sato will be designing the installation in a space that comes prepackaged with Frank O. Gehry's distinct imprint. Instead of creating a frame, they will be working within one: here, double-height ceilings with permanent marine-grade natural-finish plywood columns erupt in helter-skelter clusters that create silhouettes and shadows. The space in Montreal will engage in a more active dialogue with Kuramata's furniture. Instead of the ethereal, contemplative quality of the Grey installation, the meeting of Gehry and Kuramata will almost certainly be characterized by playfulness verging on the apocalyptic.
*Victoria C. Rowan*

## Japan 2000

In the past 50 years, the character of Japanese architecture has gone through a remarkable evolution, from desperate utilitarianism, as cities devastated by war were rebuilt, to the flashy, heedless commercialism of the 1980s' speculative economy, to the adventurous public-minded projects of today.

In the 1990s much of Japan's best architecture is in the public rather than the commercial realm, and it is being funded by government sources. Furthermore, many of these projects were designed by internationally known designers like Fumihiko Maki and Arata Isozaki and by virtually unknown younger architects, instead of the architecture-construction behemoths that have typically dominated public building in Japan.

Giving this new public architecture an audience and putting it in a social perspective was the intention of "Japan 2000: Architecture for the Japanese Public," an exhibition at the Art Institute of Chicago. Guest-curated by Naomi Pollock, an American architect who lives and works in Japan, the exhibition was the first in a series of three that will explore the role of the Japanese

*(continued on page 46)*

**The Noh Stage in the Forest, by Kengo Kuma & Associates, blends structure and landscape.**

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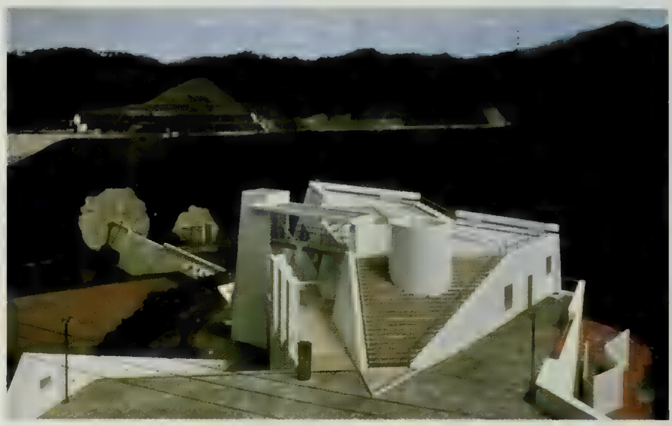
(continued from page 44)

government in fostering innovative architecture and industrial design. (It will also be shown in the San Francisco airport later this year and two locations in Berlin in 1999.)

The 17 projects Pollock has chosen are wonderfully varied in program and expression: a traditional Noh theater, a resort, a conceptually complex bridge, a school and community center, several sports facilities, a museum, a police station, and a crematorium are among the featured projects. Scattered across the country, many of these public facilities enrich small communities that have not enjoyed such amenities before.

Pollock's catalogue essay traces the beginnings of these projects to 1988, when Arata Isozaki was appointed to Kumamoto Prefecture's new Artpolis program. With the sanction of Governor Morihiro Hosokawa, Isozaki would circumvent the government bureaucracy (which inevitably commissioned large, politically connected firms) to select architects directly for public works projects. Isozaki chose young, talented, independent architects for the first phase, which consisted of 40 projects of differing scale. "Artpolis succeeded brilliantly in turning a sleepy agricultural region into an architectural mecca of international repute," Pollock writes. It was not long before other prefectures sought to emulate this success with their own projects and architects.



**Norihiko Dan's community center will serve as a public amenity for those forced to abandon their homes for the building of Hiyoshi Dam.**

The exhibition offers a look at a soon-to-be-completed gallery for the Tokyo National Museum by Yoshio Taniguchi (who won the commission to expand the Museum of Modern Art in New York). The freestanding gallery, which will house the Horyuji temple treasures, is distinguished by a remarkable delicacy in scaling and detailing. Two sides of the building are glazed, with a steel screen in front and a canopy above, and the brightly lit interior contains the lobby and lounge areas. The other two sides, clad in stone, house the exhibition and preservation areas. The transparency demonstrates the public ownership and accessibility of the objects; the opaqueness shows the government's responsibility in protecting and caring for the treasures.

The show includes two stadiums, a building type that has had great significance in Japan since Kenzo Tange's National Olympics Stadium was built for the 1964 Tokyo games. Architectural historian Reyner Banham said the games marked the end of the postwar reconstruction and the beginning of Japan's economic ascent. Tange's design remains as extraordinary as ever. In looking at these two new

(continued on page 48)

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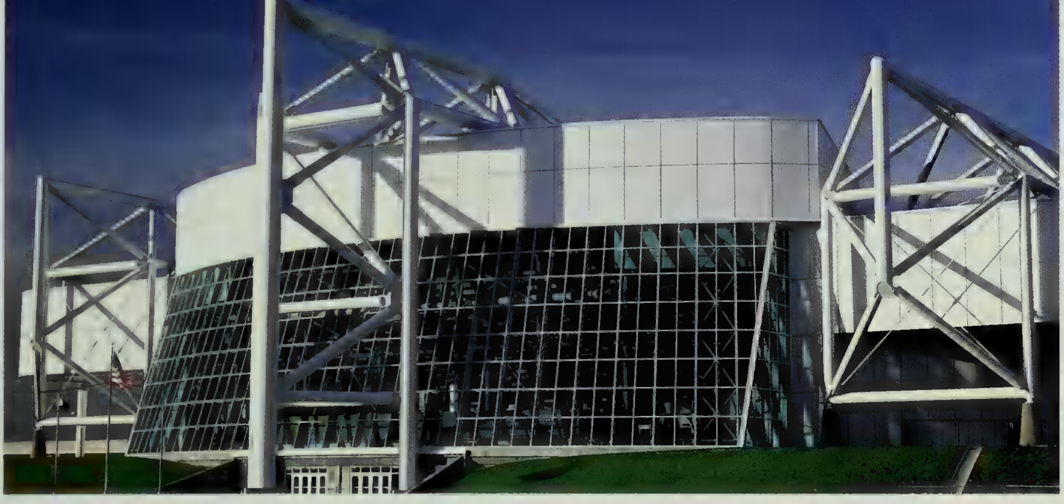

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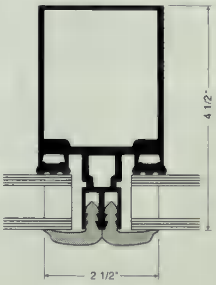

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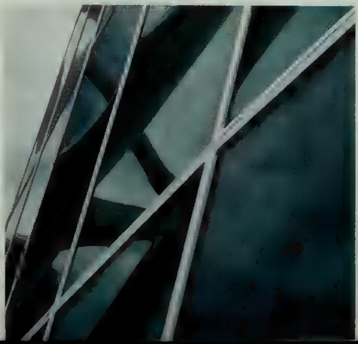

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*(continued from page 46)*

stadium designs, one can almost feel the architects tensing like athletes running toward the high hurdle: can they match Tange?

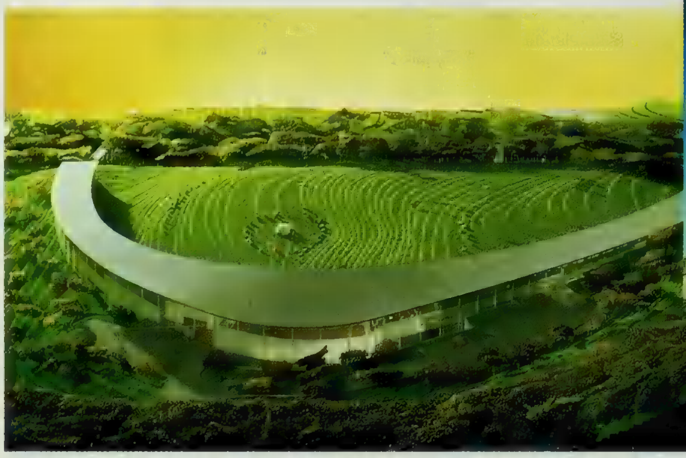
The Miyagi Stadium, by Haryu & Abe Cooperative Atelier, will not be built until 2000, but the model, showing arcing, overlapping crescents enveloping the oblong field, looks promising. The recently completed Kumamoto Stadium, or Buoyant Cloud, by Teiichi Takahashi of Daiichi Kobo Associates, is intriguing. Ingenious engineering will permit the ceiling membrane to be opened to the sky. And the building form is softer, less overwhelmingly monumental than most stadiums, with a billowing skirt draping away from the glass-and-steel cylinder that encloses the playing field.

Another exceptional example from the exhibition is the Noh Stage in the Forest, in Miyagi Prefecture, designed by Kengo Kuma & Associates. In a poetic return to traditional Japanese construction, the natural wooded environment and the building blend into one another.

With the Mamihara Bridge, architects Jun Aoki & Associates commemorate the community's past as a stopover for travelers on the old post roads. Cars travel over the upper deck, and an inverted lower deck for pedestrians serves as a gathering place.

The catalogue essay illuminates the conditions peculiar to Japan, explaining, for example, the circumstances that have led to the dominance of large construction-architecture conglomerates in obtaining most commissions in the country. Pollock's insights into Japanese architecture and her knowledge of the subject (which she also writes about as a RECORD correspondent) make the text well worth reading.

Because no labels or interpretation are provided in the exhibition, the catalogue serves as a useful accompaniment for viewers who are unfamiliar with architectural drawings and models. The work in "Japan 2000," much of which is marvelous and inventive, deserves to be made accessible to as wide an audience as possible. *Cheryl Kent*



**Toyo Ito's Ota-ku hotel/school complex in Nagano (left), and Kisho Kurokawa's Fukui City Museum of Art (above).**

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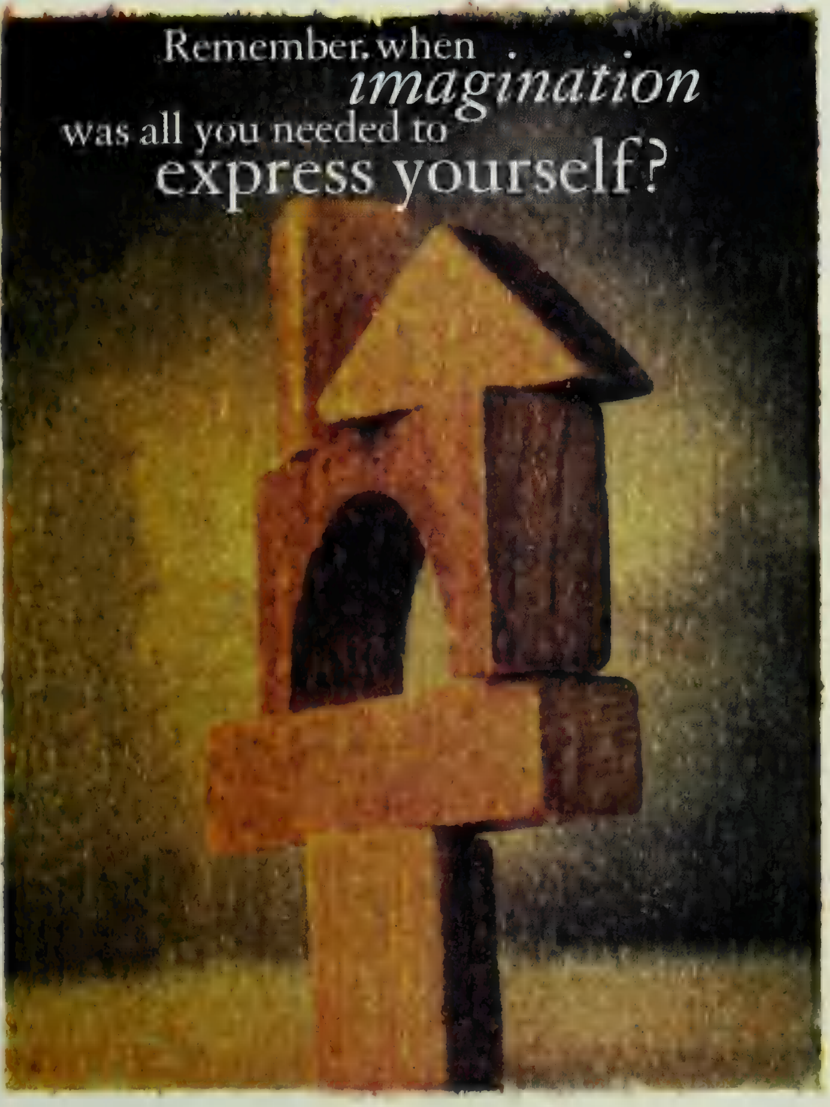

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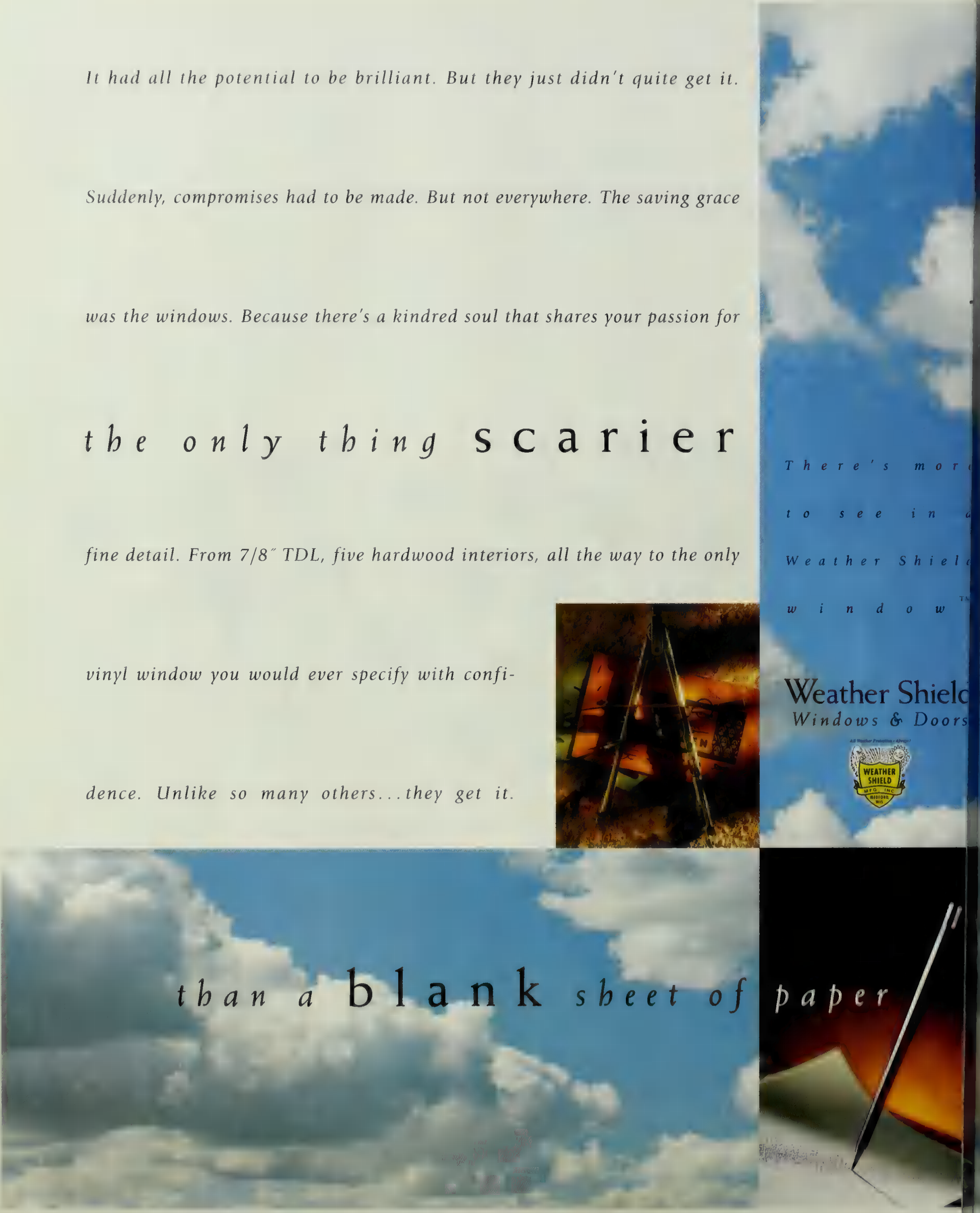

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# CORRESPONDENT'S FILE As a once forlorn San Francisco area gains cachet, artists are squeezed out of affordable housing.

BY ERIC C. Y. FANG

*Eric C. Y. Fang, AIA, is an architect and urban designer with Skidmore, Owings & Merrill in San Francisco.*

San Francisco's 80-block neighborhood south of Market Street looks much as it has for years. To be sure, the signs that gentrification is taking place along SoMa's broad one-way streets—spruced-up storefronts and warehouses converted into trendy bars and nightclubs—are obvious. The essential physical framework, though, remains the same. SoMa is a jumbled mix of two- and three-story brick warehouses, hulking metal industrial buildings, and four-story wood-framed SROs that once housed shipbuilders.

But turn into alleys like Zoe or Clementina, named after the wives and daughters of the area's early settlers, and you see signs of something new. Here, taut new five-story stucco buildings with metal balconies stand side by side with jewelry manufacturers, auto-body shops, and Victorian-era triple decker houses. Sleek volumes of corrugated metal with large expanses of glass hover over the sidewalk. In the past five years scores of these buildings have gone up in a boom that has not only breathed new life into the city's residential architecture but also sparked San Francisco's most heated land-use conflict in years.

## Unintended consequences

Originally, city planners intended to create affordable housing in SoMa for artists. Instead, they spurred a rapid gentrification that forced real estate prices out of the reach of the very people it was supposed to benefit. Artists had been using the area's large, cheap warehouses for studios since the early 1970s. By the end of the decade the city had revised its housing code to allow for live-work occupancy, but it proved limited in addressing the artists' needs. Within a few years artists started agitating for action.

In 1989 the Planning Department responded by creating special zones south of Market Street in which live-work spaces could be built under commercial zoning regulations. As a practical matter, this meant that all such units would have no lot-coverage or side- or rear-yard requirements but higher height limits, and could avoid design review. Because the Planning Department's main objective was to preserve existing housing and encourage new housing for artists, a key stipulation in most of these zones was that the "work" component be limited to "arts activities."

Loft conversions, of course, had been going on for decades in cities like New York, Chicago, and Philadelphia. But several factors prevented the trend from catching on here: stringent seismic regulations and San Franciscans' insistence on living with their cars. The first to match the implications of the new ordinance with the demographic and market trends of the late 1980s was developer Rick Holliday. He and architect David Baker addressed these problems beginning in 1990 with a series of warehouse conversions in an area zoned for professionals' as well as

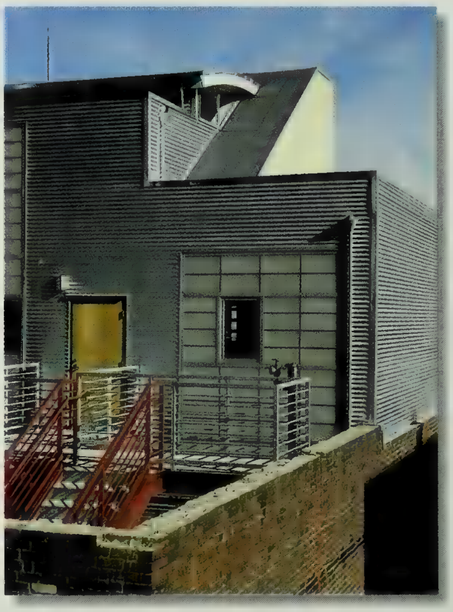
**Lofts by David Baker, one of the first of the new loft projects, benefited from city subsidies for evicted artists.**

artists' live-work use, with parking in adjacent buildings.

Because they were conversions, the design of these projects was minimal. Looking to New York City's SoHo for inspiration and drawing on findings from focus groups conducted by Holliday, Baker developed a strategy that capitalized on the character of the old loft buildings and deployed new architectural elements only at select locations. Holliday gives Baker particular credit for employing his contacts among local artisans to create such interventions as the twisting timber and aluminum staircase at the Clocktower lofts and the hand-wrought metal gates at 355 Bryant Street—quirky elements that make a powerful statement. With these conversions, Holliday and Baker identified an emerging market niche for live-work: designers, entrepreneurs, and other knowledge workers. What's more, they made the notion of living in SoMa chic.

The most surprising impact on the SoMa streetscape has been made by small-scale builders in the area and the new live-work lofts that began appearing in the alleys around 1992. Residential building at this end of the market—15 units or less—had long been dominated in the city by "Irish builders," the first-generation Irish immigrants who developed and built much of the neighborhoods, such as Richmond and Sunset, in the western part of the city in the 1960s and '70s.

In the early '90s, as downzoning, a scarcity of vacant sites, and NIMBYism slowed construction in these neighborhoods to a near standstill, the Irish builders set their sights on the cheaper land and more relaxed development climate south of Market. Their first buildings, small infill projects in alleys zoned for artists' lofts, were enabled in part by the increased densities allowed by the '89 ordinance. Their success, fueled by the emergence of multimedia businesses around South Park (in eastern SoMa), and skyrocketing housing costs throughout the city, attracted other builders. By 1996 new lofts accounted for more than 20 percent of the city's annual housing construction.



**Capehorn Lofts, a 16-unit high-end conversion by Pfau Architects, makes generous use of Kalwall and corrugated steel.**

### A new housing type emerges

But these buildings were different from the projects by the same builders in western neighborhoods—homely brick and stucco numbers locals call Richmond Specials. The salient characteristics of the emergent type—two floors of double-height lofts with partial mezzanines above a ground-floor garage—can partially be explained by the '89 zoning ordinance, new building code regulations on live-work spaces, and of course economics: although the building type

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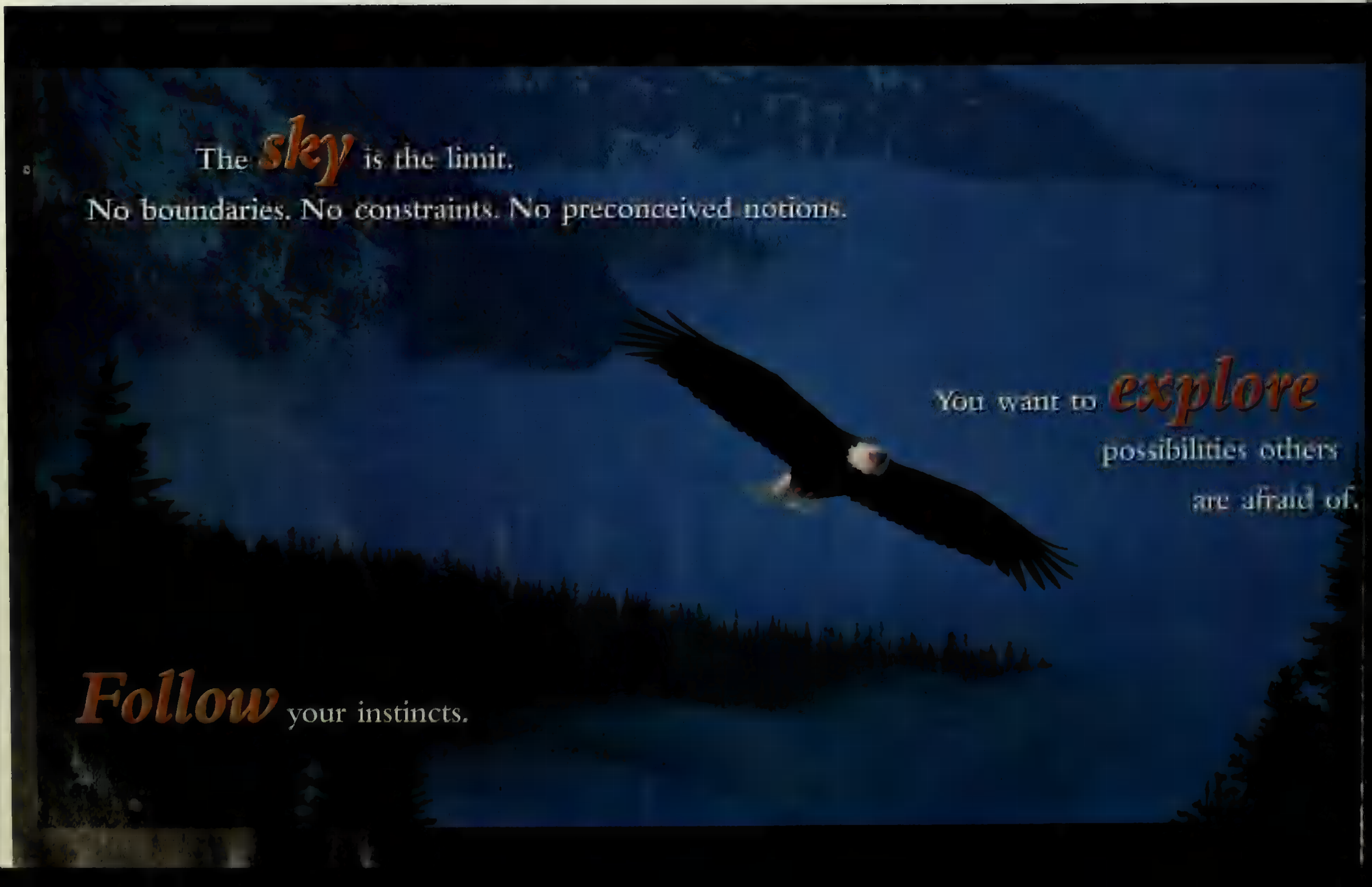
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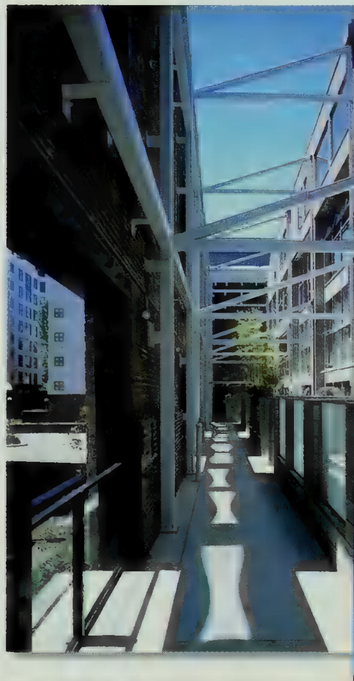
contains five floors, it qualifies as three floors according to code and thus can be framed in wood.

The design sensibility of these buildings reflects the builders' savvy about the new market attracted to SoMa and their alliance with younger, more design-oriented architects. One of the most active of these is Sternberg Benjamin Architects (SBA), who have become perhaps the city's most prolific designers of live-work projects by providing "builders' sets"—documents that set the basic form, organization, and exterior materials but cede the detailing to the builder.

SBA's projects, like most of the new live-work projects, typically draw from the industrial palette of the area—corrugated metal siding, Kalwall, and lots of stucco. They also incorporate many of the elements introduced by Baker that are now de rigueur for live-work spaces, like artisan-designed metal entry gates. The risks of builders' sets are seen in their uneven execution, manifested in the occasional extraneous polystyrene molding or saccharine color scheme. SBA's best buildings, like their 12-unit project at 50 Lucerne Street, tend to be their "dumbest"—simply detailed and well-proportioned, with innovations like bay windows and ground-floor work spaces that provide separate street-level business entrances for second-level units.

The new loft construction boom has not only provided work for younger designers, but it has also provided opportunities for more established architects to explore different aspects of the type. On the high end of the market are rehabilitations like Fisher Friedman's Oriental Warehouse and Capehorn Lofts by Pfau Architects, located on either end of Delancey Street. Called life-style lofts by some, these projects take more of a "custom spec house approach" by providing more extensive interior finish packages, explains the Capehorn's project architect, Dwight Long. In both projects, budgets ranging from $125 to $150 per square foot allow generous use of materials such as galvanized steel and refined detailing that lets the architects create



**Fisher Friedman Architects' Oriental Warehouse, completed last year, created 66 lofts within the fire-damaged shell of a historic 19th-century warehouse.**

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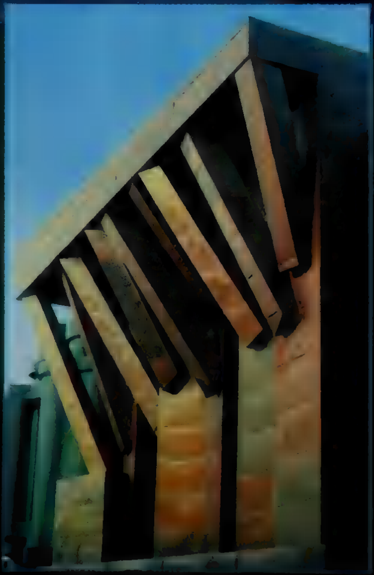

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sophisticated dialogues between the new lofts and their existing brick shells.

Other architects have investigated construction and tectonic issues. Toby Levy's mixed-use project in South Park, which houses her office on street level and family above, explored the implications of incorporating nontoxic materials such as structural Homasote. Stanley Saitowitz's pursuit of maximum flexibility and transparency in his Natoma Street and more recent Tennessee Street projects has returned the aesthetic expression of the type back to its industrial origins. The street facades of both buildings bring the steel moment frame to the exterior, reflecting the structural system rather than more conventional interpretations of traditional San Francisco residential architecture.

The still evolving balance between "live" and "work" has also suggested ways in which new collective forms may develop from the type. At the Clocktower Lofts, Baker carved large courtyards out of the deep floor plates of three old industrial buildings. They combine California informality with a level of finish and control that bespeaks a place of business. Baker, who works in a Clocktower loft, likens the building to an "urban district," where people commute within the building.

**Toby Levy Design Partners' mixed-use project in South Park, the epicenter of San Francisco's Multimedia Gulch, houses the architect's office on street level and her living quarters above.**

SoMa's growing status as the regional center for multimedia businesses has injected an additional element into the live-work market. The Bluxom Street lofts by Mark Horton Architects, a 102-unit project still in construction, have been targeted for technology and multimedia workers. Plans call for a digital concierge to provide 24-hour computer support and Cat-5 and T-1 lines wired into each unit. Architect Peter Pfau predicts that devising a new type of corporate environment for businesses that eschew conventional class-A office space may be the next wave in the area as more firms seek to establish a presence in SoMa's Multimedia Gulch.

The interesting thing about this particular moment is that SoMa's architecture does not yet have a "style." While there is something vaguely defined as "industrial" (per the planning code) that underlies all of the new construction, that term has, happily, been left uncodified. Corrugated metal is put up horizontally in some projects, and vertically in others. Some projects explore a more residential expression through increased facade articulation, while others suppress residential character, stressing instead flatness and simplicity. But SoMa's new architects are not preoccupied with matters of appearance; the continual tinkering with the type is a sign that they are focusing as much on what the housing does as on what it is.

*(continued on page 60)*

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*(continued from page 58)*

**Planning sparks controversy**

The new housing raises several larger issues. Urbanistically, the incremental nature of the infill projects has allowed SoMa's distinctive scale and grain—especially in the alleys—to remain intact. But the question of whether the new live-work housing will add up to something more and contribute to the public realm has yet to be answered. With street-level facades occupied largely by garage doors and double-height windows floating above the street, the live-work buildings tend to stand aloof from their still-gritty urban surroundings. This perhaps reflects the new lofts' status as favorites of tech workers reverse commuting to Silicon Valley. But SoMa's five-lane one-way streets, narrow sidewalks, and block-long warehouse walls have never made it a particularly pedestrian-friendly part of town. The influx of new residents has produced a clamoring for more amenities like grocery stores and dry cleaners. A reevaluation of the area's urban design and open space needs should not be far behind if it is to evolve as a living quarter of the city, and not just become what architect Daniel Solomon calls an "inner-city bedroom community."

The influx of new residents, and the conspicuous absence of artists among their ranks, is also forcing the city to reckon with larger, more painful land-use issues, including the future of industry here. With recent lofts selling for an average of $250 to $260 per square foot, and many artists moving across the bay to Hunter's Point and Emeryville, it would seem that the battle for affordable artists' housing is over. But the '89 ordinance brought into the open a conflict that has embroiled artists, owners of SoMa industrial businesses, architects, the Irish builders, and neighborhood associations.

Earlier this year the Planning Commission held hearings on the live-work controversies. Testimony ran well into the night. Artists charged that the new development has worsened their own housing situation; longtime SoMa residents and industry owners feared that their new neighbors would drive them out. Architects and builders pointed out that in a city with a 1 percent vacancy rate and the country's highest housing costs, the new lofts' contribution to the housing inventory can only be seen as positive. San Francisco's Planning Department acknowledged the value of the new housing but ultimately enacted new remedial restrictions that will most likely make live-work developments in SoMa more difficult to develop.

But the cat's out of the bag. As recent sales figures attest, the new lofts, with their flexibility, expansive volumes, and large windows, have captured the imagination of both longtime residents and people wanting to move back into the city. The industrial aesthetic has also been adopted by the multimedia crowd.

For people in other cities, these developments may not seem extraordinary. But for those familiar with the recent architectural climate in San Francisco, they are nothing short of remarkable. Because of a trying approvals process, a strong sentimental streak, and a touch of complacency, the environment here has been far less conducive to progressive architecture than, say, Los Angeles, or even the San Francisco of the 1960s. The new wave of housing signals that San Francisco may at last be moving beyond the Victorian "painted ladies," Mission-style stucco boxes, and Shingle Style houses that have long defined its residential vernacular. Historian Kevin Starr recently said, "San Francisco needs a new story to tell about itself." If so, then SoMa's current development boom may be architecture's contribution to that story. ■

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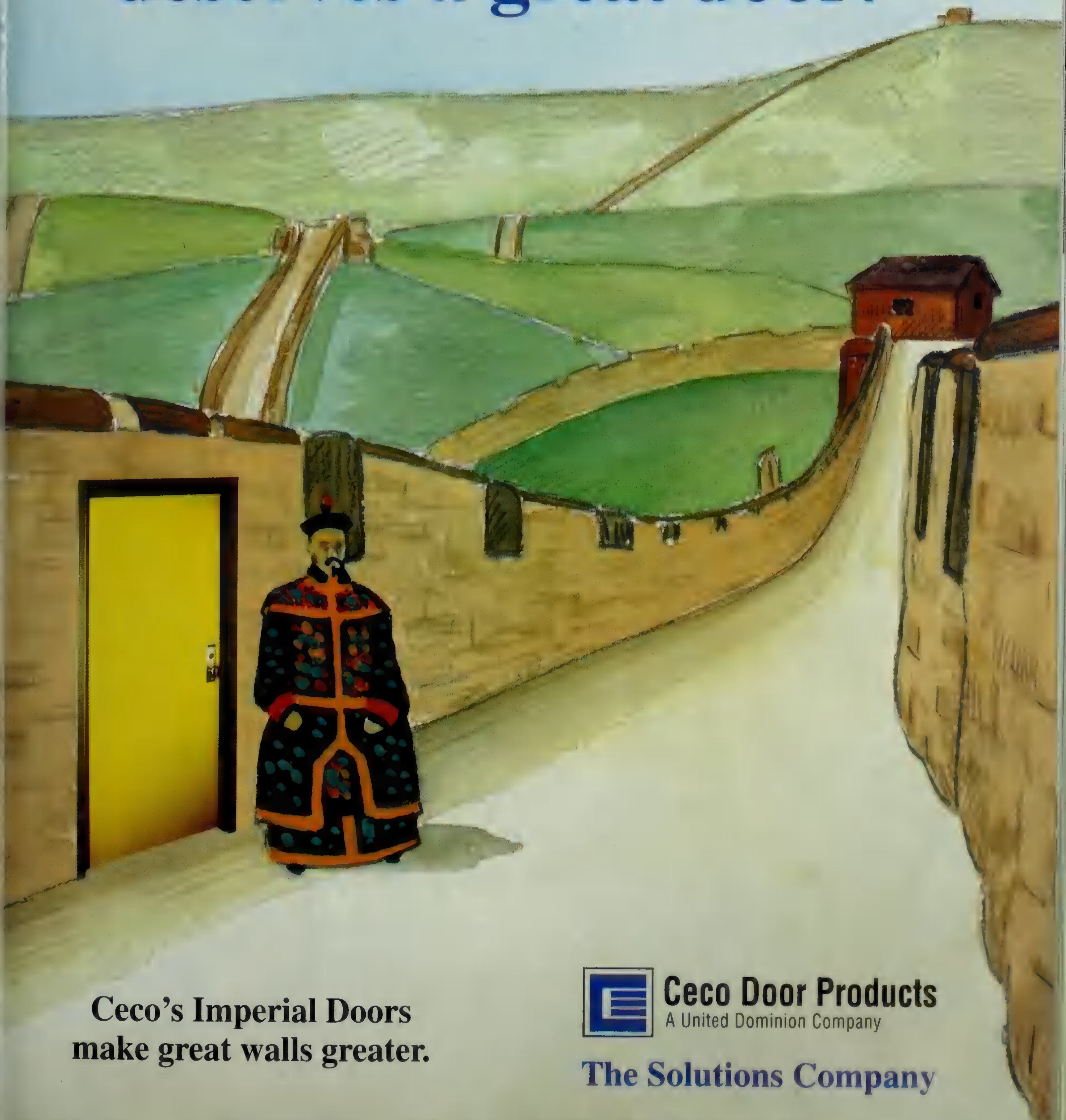

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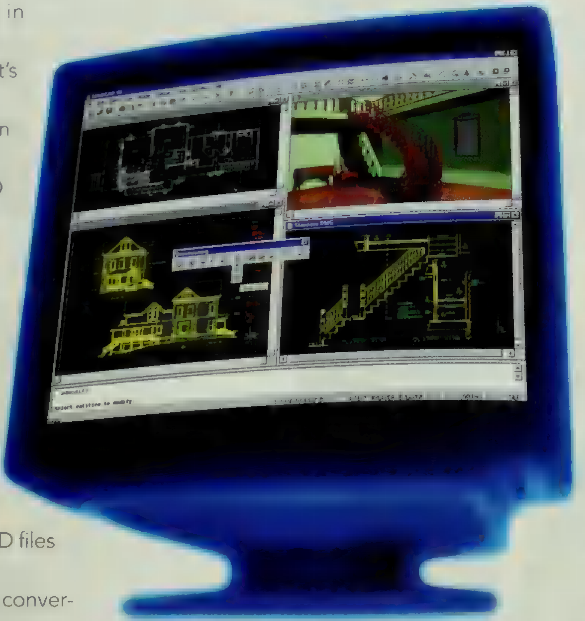

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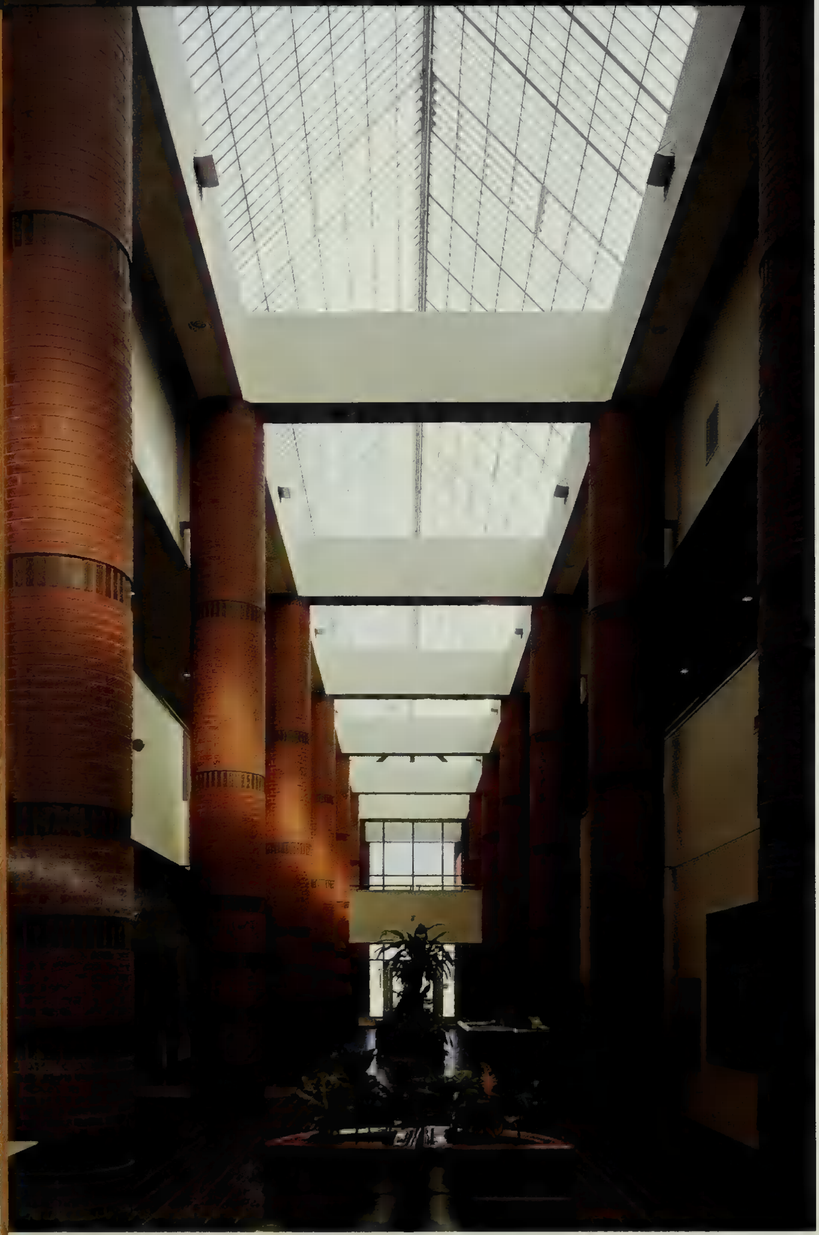

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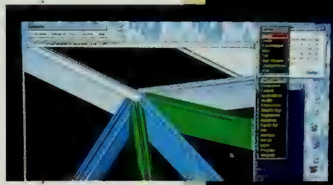

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# Calendar

**Arquitectonica: The Times Square Project**
**New York City**
*Through May 10*
The first solo exhibition in New York of work by the Miami-based firm focuses on the architects' design of a mixed-use complex combining a hotel with entertainment and retail components, to be built at 42nd Street and Eighth Avenue. Cooper-Hewitt National Design Museum. 212/849-8300.

**Civics Lessons: Recent New York Public Architecture**
**Washington, D.C.**
*Through May 11*
Projects in New York initiated by public agencies working with architects from 1985 to 1995. Organized by AIA/New York and the New York Foundation for Architecture, the show emphasizes the link between public investment in architecture and the economic, social, and aesthetic quality of the city. National Building Museum. 202/272-2448.

**Alvar Aalto: Between Humanism and Materialism**
**New York City**
*Through May 19*
Marking the 100th anniversary of Aalto's birth, this large-scale retrospective is the first in the United States to present original drawings and models of work by the renowned Finnish architect, designer, and town planner. Video walk-throughs of several of his most important buildings are included. Museum of Modern Art. 212/708-9400.

**Position/Paradox**
**New York City**
*Through May 19*
An exhibition of work by the six winners of the Architectural League's annual competition for young architects and designers, accompanied by a lecture series. Urban Center. 212/753-1722.

**Lightforms '98**
**New York City**
*Through May 31*
Three monumental, site-specific, interactive light sculptures—winners in the Lightforms competition—are on display. New York Hall of Science. 718/816-9796.

**Kisho Kurokawa Retrospective**
**London**
*Through June 13*
"From the Age of the Machine to the Age of Life," a major retrospective of the work of Japanese architect Kisho Kurokawa, from his early projects with the Metabolist Group through his current addition to the Van Gogh Museum in Amsterdam. RIBA Architecture Centre. 011/01-1-580-5533.

**Finnish Modern Design: Utopian Ideals and Everyday Realities**
**New York City**
*Through June 28*
Featured in the exhibition are glass, ceramics, furniture, textiles, metalwork, and industrial design. Organized by the Bard Graduate Center for Studies in Decorative Arts in New York and the Museum of Art and Design in Helsinki. Bard Graduate Center. 212/501-3000.

**Titanium!**
**New York City**
*Through June 30*
An exhibition demonstrating the range and diversity of titanium, including its recent architectural applications in the Guggenheim Bilbao and elsewhere. Material ConneXion Gallery. 212/445-8950.

**Architecture in Perspective**
**Washington, D.C.**
*Through July 5*
This juried exhibition, organized by the American Society of Architectural Perspectivists, features 55 renderings, including the six winners of the Hugh Ferriss Memorial Prize. The Octagon. 202/879-7764.

**Changing Places: Looking at Southampton**
**Southampton, New York**
*Through July 12*
An exhibition of paintings, maps, plans, and photographs documenting Southampton sites and how they have changed over time. The show explores issues of village planning, land use, and demographic change. On May 15 and 16, a forum on architecture and planning in Southampton will be held. Parrish Art Museum. 516/283-2118.

**Architecture of Independence: Making of Modern South Asia**
**Pittsburgh**
*Through July 19*
The work of four South Asian architects—Charles Correa, Achyut Kanvinde, Balkrishna Doshi, and Muzharul Islam—is included in this traveling exhibition. Heinz Architectural Center, Carnegie Museum of Art. 412/622-3131.

**Landmarks of New York**
**New York City**
*Through August 23*
An exhibition of historical photographs celebrating New York's centennial, accompanied by a symposium, walking tours, and panel discussions. New-York Historical Society. 212/861-4641.

**National Design Triennial**
**New York City**
*Through September 12*
A survey of developments in contemporary design, investigating how issues and ideas drive design practices in America. Cooper-Hewitt National Design Museum. 212/849-8300.

**Completing the Federal Triangle**
**Washington, D.C.**
*Through September 27*
An exhibit documenting the development of the Ronald Reagan Building and International Trade Center on Pennsylvania Avenue, from a design competition in 1989 to the building's recent completion. The winning design was by Pei Cobb Freed & Partners in association with Ellerbe Becket. National Building Museum. 202/272-2448.

**New Ways of Revitalizing the American City**
**Washington, D.C.**
*May 2–January 3, 1999*
An exhibition illustrating how new cultural facilities have brought life back to tired downtowns in Phoenix; Cincinnati; Fort Worth; Newark, New Jersey; San Jose, California; and Kansas City, Missouri. National Building Museum. 202/272-2448.

**Design ADAC '98**
**Atlanta**
*May 6–7*
The annual marketplace for design professionals. This year's theme: Stars of Design. Seminars, product previews, and networking opportunities are the featured fare. Atlanta Decorative Arts Center. 404/231-1720.

**Move into the Open**
**Hamburg, Germany**
*May 7–9*
A series of debates and conferences, including architects, artists, writers, and scientists, inspired by the work of architecture theorist Henri Lefebvre and examining the concept of "open topologies." Academy for Fine Arts. Fax 011/49-40-37-22-22 for ticket information.

**Maya Color: The Painted Villages of Mesoamerica**
**Washington, D.C.**
*May 8–June 26*
Paintings and photographs by Jeffrey Becom and Sally Jean Aberg explore the symbolism of color in ancient and modern Mayan architecture. AIA Headquarters Gallery. 202/638-3221.

**Federation for Housing and Planning Conference**
**Lelystad, The Netherlands**
*May 10–13*
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*(continued on page 69)*

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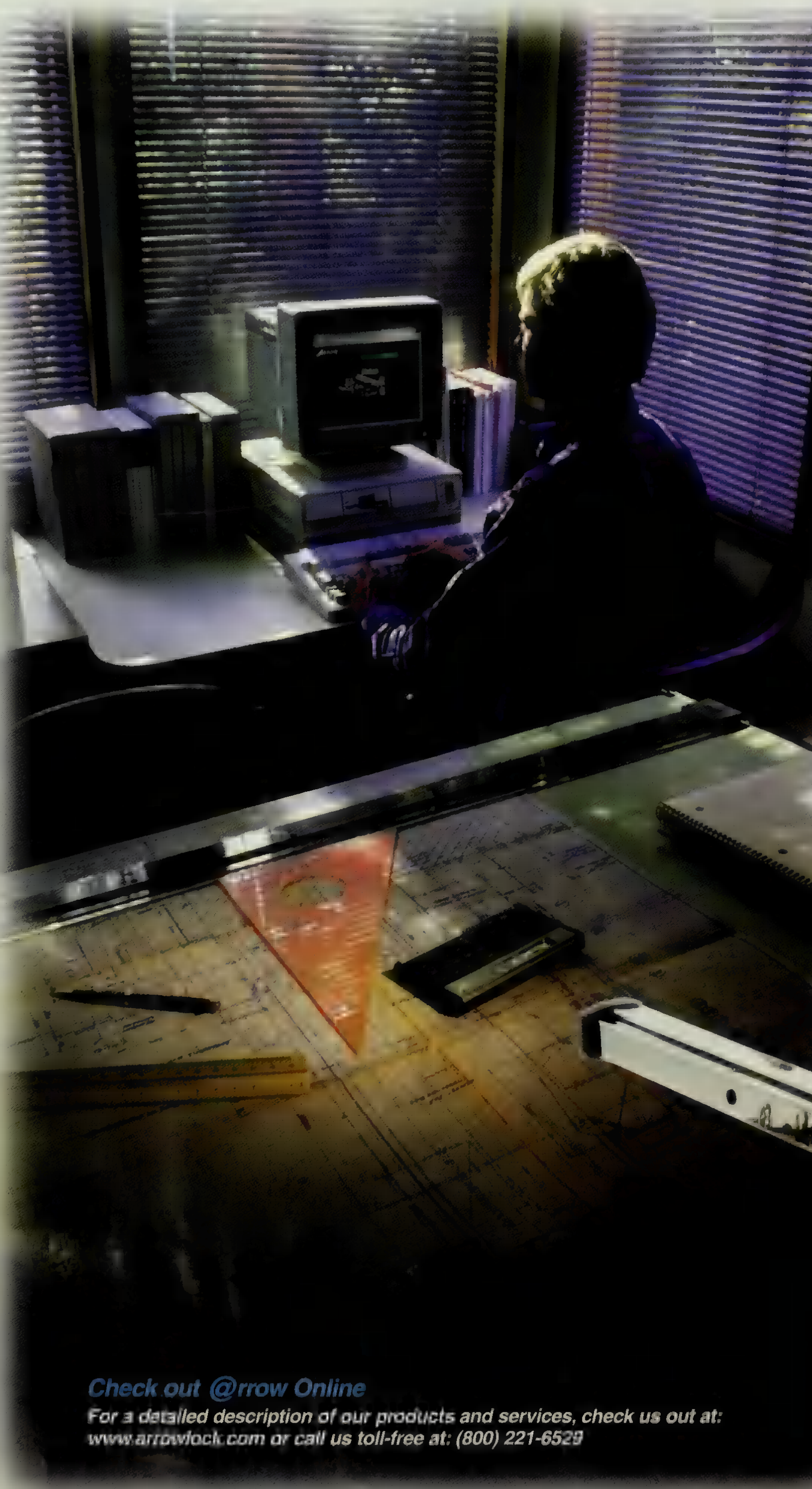

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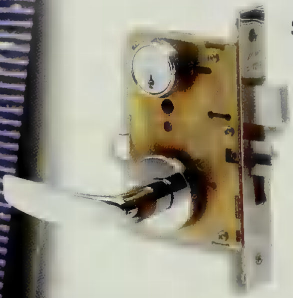

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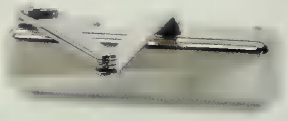

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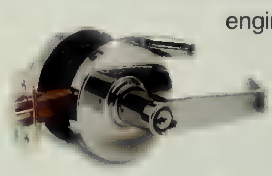

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*(continued from page 67)*

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**1998 AIA National Convention and Expo**
**San Francisco**
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Twelve thousand industry professionals are expected to attend this year's convention at the Moscone Convention Center. Apart from the usual array of products and services on exhibit, representatives of federal agencies will discuss design-contract opportunities. An AIA/Rizzoli bookstore will also be in operation. In addition, there will be opportunities to earn continuing education credits. This year, for the first time, registration for the convention will be free for all members of the AIA. For information about exhibiting, call 617/859-4483. For other information, call the AIA at 202/626-7395 or check the convention Web site at www.aia98.org.

**International Contemporary Furniture Fair**
**New York City**
*May 16–19*
Includes more than 400 exhibits by manufacturers and designers of contemporary furniture, lighting, floor and wall coverings, textiles, and decorative accessories. Jacob Javits Center. 212/879-5776.

**Women in Architecture Film Festival**
**Washington, D.C.**
*May 20 and 23*
The Northern Virginia chapter of the AIA, with the support of the National Museum of Women in the Arts, is sponsoring this series of documentaries on architects such as Charlotte Perriand, Eileen Gray, Mary Jane Colter, and Maya Lin. Panel discussions featuring local women architects will follow. National Museum of Women in the Arts. For information call 703/549-9747.

**ACSA International Conference**
**Rio de Janeiro**
*May 23–27*
The first international conference of the Association of Collegiate Schools of Architecture to be held outside Europe. Architectural educators, scholars, and professional architects will be in attendance. Exhibits of publications, computer programs, and services are also featured. Universidade Federale. For information call the ACSA in Washington, D.C., at 202/785-2324.

**Lightfair International**
**Las Vegas**
*May 26–29*
The world's largest architectural and commercial lighting conference is also North America's largest lighting trade show. There will be 350 exhibiting manufacturers and 12,000 attendees. Architects can earn continuing education credits at the pre-show conference on May 26. Las Vegas Convention Center. Call 800/856-0327 to register.

**Shifting Gears: In Pursuit of a Greener City**
**Toronto**
*May 26–September 27*
An exhibition proposing urban design strategies for reducing carbon dioxide emissions. Design Exchange. 416/216-2145.

**Philippe Starck Exhibition**
**Miami**
*May 29–June 14*
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*(continued on page 360)*

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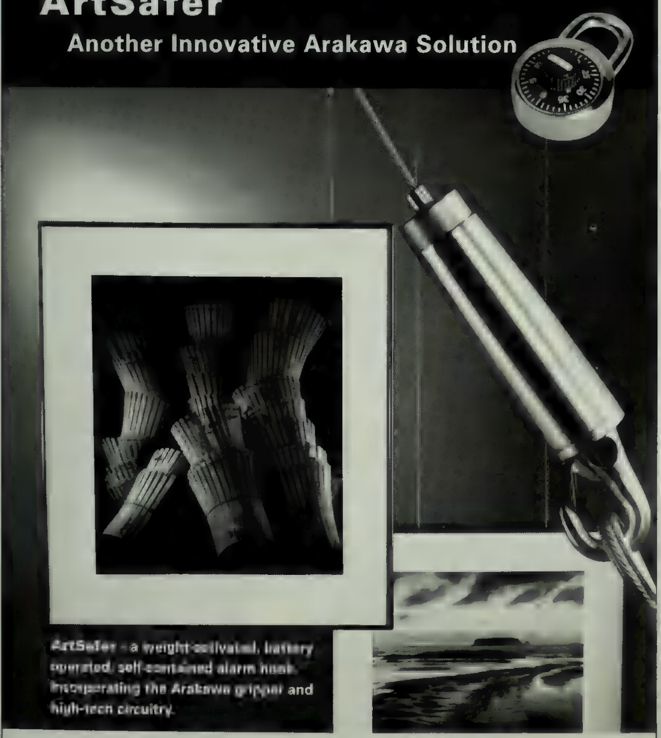

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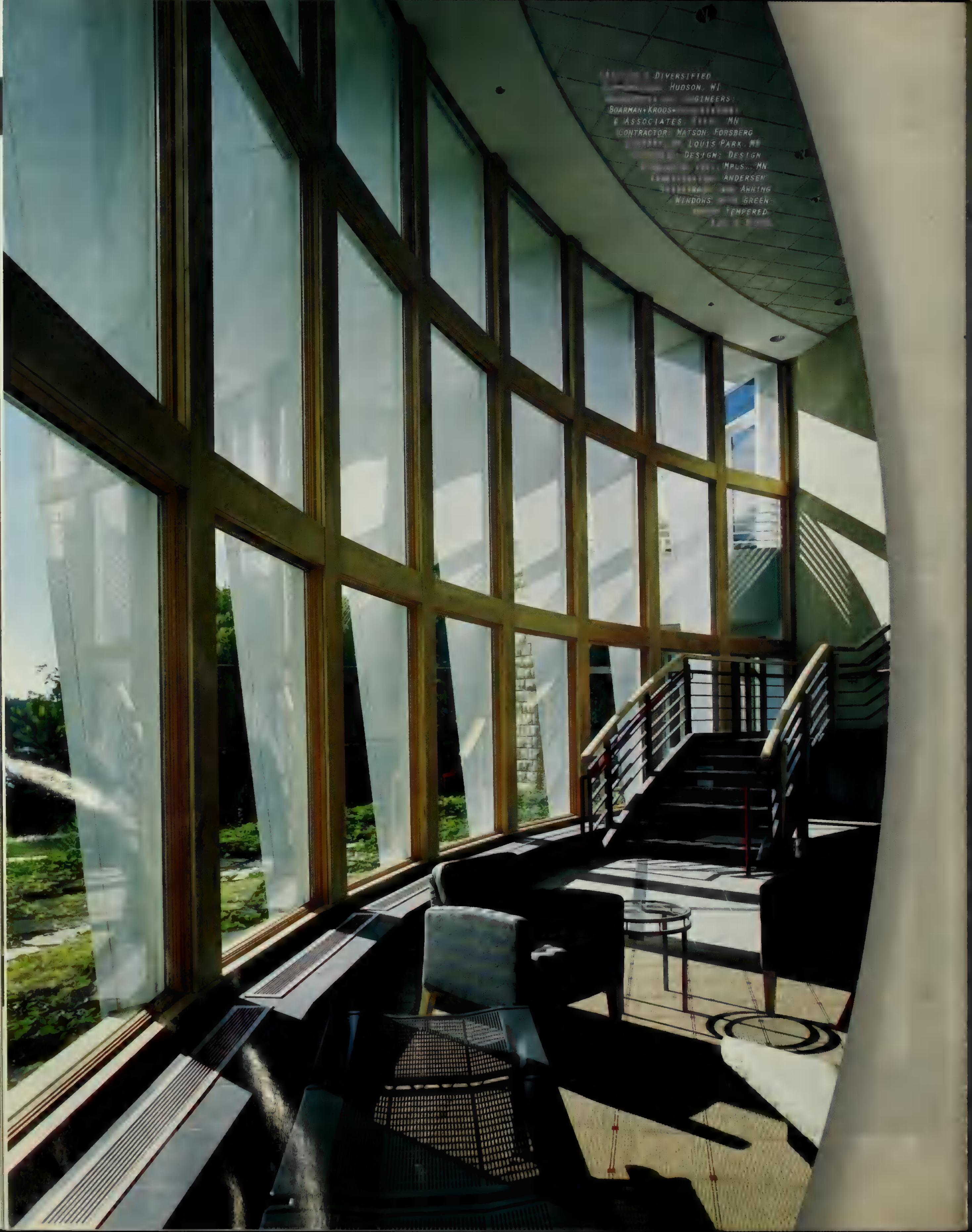

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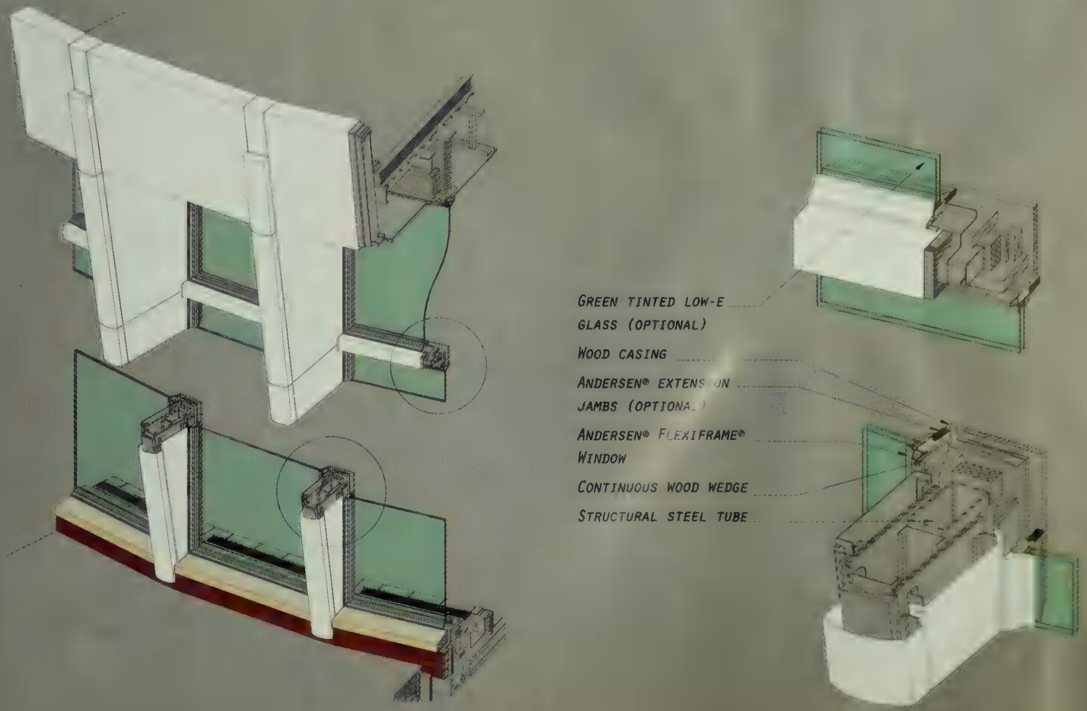
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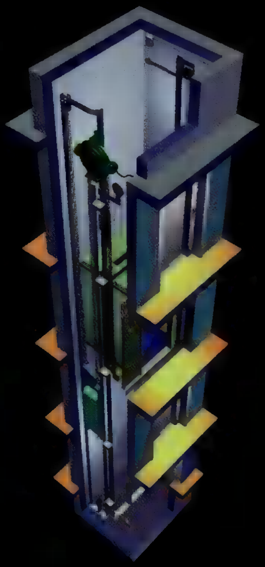

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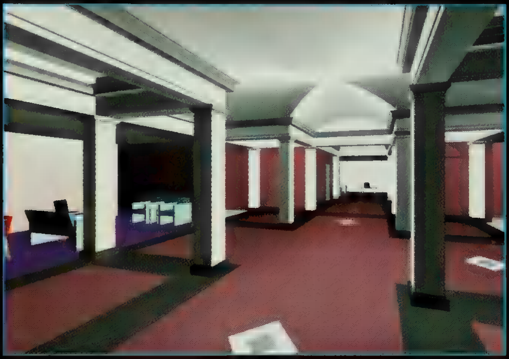

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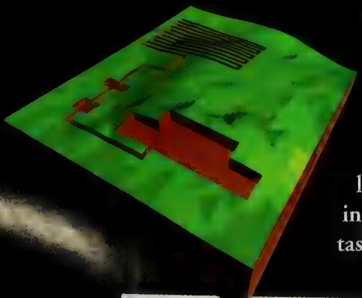

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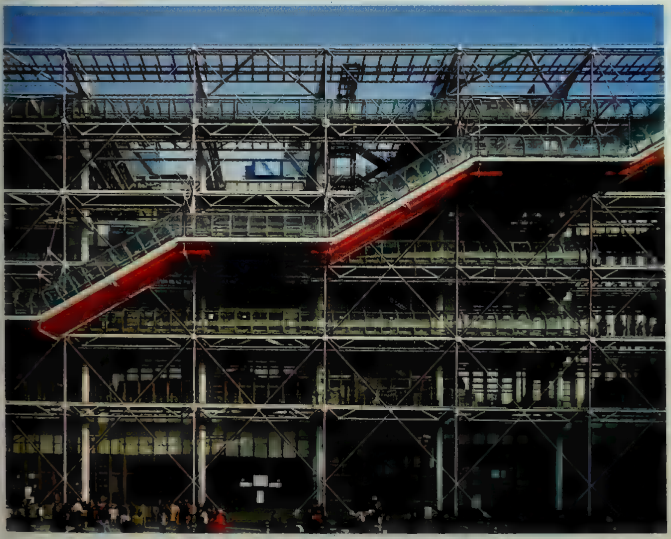
## PRITZKER WINNER RENZO PIANO PLAYS MUSIC ON AN URBAN STAGE

Renzo Piano, this year's winner of the Pritzker Architectural Prize, leaped to notoriety in 1976 with the opening of the Centre Georges Pompidou in Paris (below). Since then, the 60-year-old Italian has forged his reputation with complex efforts in cities around the world, many of them described as futuristic. Nevertheless, as he states in the following interview, Piano—who grew up in Genoa and now has offices there and in Paris and Berlin—doesn't feel he's that technologically oriented.

**RECORD:** The Pritzker committee described your work as a "rare melding of art, architecture and engineering." Do you consciously try to achieve that synthesis?



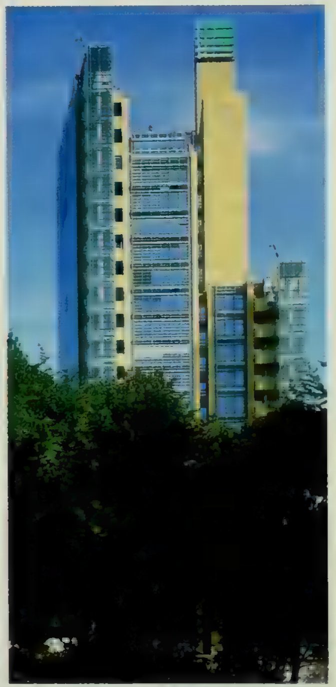
**Piano:** Even more than that, it's also about the pleasure of construction, not just engineering. As you may know, I was born into a family of builders, so I grew up with this sort of instinctive pleasure for construction. Then in the late '60s my work was mainly about experimenting; it was very naive, very innocent in some way. Of course, as you grow up you realize architecture is much more than that: architecture is history, it's geography, it's about topography, its about sociology. But I have stayed sensitive to everything on the other side—engineering, construction, and of course process as well.

**RECORD:** Did any particular architects have an early influence?

**Piano:** Certainly one was Franco Albini. He was a great architect in Milan—he made nice things—maybe not so famous but great. And when I was in school, I wasn't really in school because I was working with Franco Albini and going to school maybe twice a week. Then there is Pierluigi Nervi, and I have a great respect for Jean Prouvé, and of course Buckminster Fuller, who was a sort of philosopher. All those people. Charles Eames on the West Coast. At that age, you build up a number of masters.

**RECORD:** Looking back, what are some of your favorite projects?

**Piano:** This is a difficult answer to give, because you tend to love most the scheme you are making or are about to finish, and you tend to forget about what you finished a long time ago. I'm about to open a cultural center [in New Caledonia]—this is a very interesting project, made of wood. But of course the Potsdamer Platz [redevelopment], which is an immense scheme, is absorbing a lot of energy. The headquarters for Daimler-Benz [right] is practically finished and we are about to finish another four or five buildings. And this is a very complex scheme, because it's not about making buildings; it's about making a piece of a city.



**RECORD:** What do you think of the Pompidou now?

**Piano:** I think it was a great building, I do. I think it was very important for [Paris] at that time. Also, it helped to change the way museums have been seen. The perception of museums has been changing a lot. Pompidou was a good example of that changing moment. I think for some time I've been seen as a high-tech architect, and this is [because of] the Centre Pompidou, which is seen as high-tech. People love to put on labels, you know.

**RECORD:** And that particular label is inaccurate?

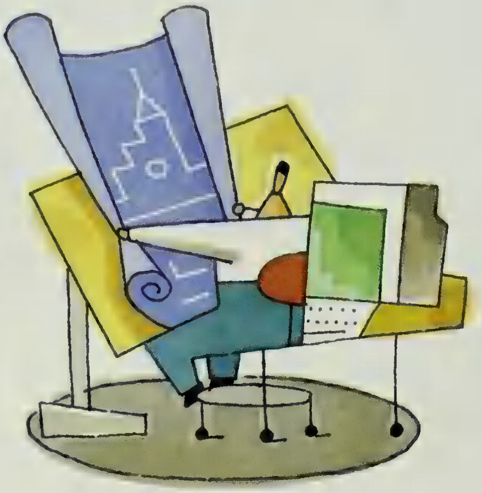
**Piano:** Yes, I think so. I would say it's more a bit like piano playing. As a piano player, even if you're the most poetic one, you must know the technique—otherwise you are lost. My idea is that you have to learn technique enough so that you are able to forget about it. And then you just play. *Soren Larson*

**AIA NAMES JURY FOR BW/AR AWARDS** The AIA has selected a jury for the second annual Business Week/Architectural Record Awards, which honor organizations that integrate creative design with enterprise: "good design is good business." The panel represents a range of fields, from the automotive industry to leading architectural firms.

Among the architects on the panel are Bernardo Fort-Brescia, FAIA, principal of Arquitectonica International in Miami; Charles Gwathmey, FAIA, principal of Gwathmey Siegel & Associates in New York; Wendy Evans Joseph, AIA, principal of her own firm in New York; Rodolfo Machado, Assoc. AIA, principal of Machado & Silvetti Associates in Boston; and Charles B. Rose, AIA, principal of Thompson and Rose Architects in Cambridge, Massachusetts.

Filling out the list are Michael Bassermann, chairman and CEO of Mercedes Benz North America; Sherri Geldin, director of the Wexner Center for the Arts in Columbus, Ohio; Olli-Pekka Kallasvuo, executive vice president of Nokia Telecommunications; John O. Norquist, mayor of Milwaukee, and Ian Schrager, owner of Ian Schrager Hotels.

The awards will be conferred in the fall; over 300 submissions have been received. *S.L.*



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## WITH MONEY MATTERS A MEMORY, BOSTON GETS A NEW COURTHOUSE

Boston's new Federal Courthouse, after withstanding a struggle over its design budget, is nearing completion at the edge of the harbor.

Before its opening, the building's concave glass wall, facing downtown Boston across Fort Point Channel, had already made the courthouse a highly visible landmark—and finances had made it a subject of heated debate. Early on, the project was attacked as too expensive, too grand. But on a per-square-foot basis, the final budget of a little over $200 is remarkably low, notes Henry D. Cobb, FAIA, of Pei Cobb Freed & Partners, who designed the building (associated architects were Jung/Brannen Associates Inc. of Boston).

The courthouse has been made to look conspicuous and even rich in order to celebrate its civic function, Cobb says. But it achieves its effects through detailing and monumental shapes, not luxury finishes. The $162 million, 765,000-square-foot building contains 27 courtrooms (about three times the average number), as well as extensive public facilities. The courtrooms are grouped on three levels around a glazed, multistory common space that opens onto a public garden and a new Harborpark. The latter was designed as an integral part of the whole by the Olin Partnership and Carole R. Johnson & Associates.

The building design is intended to reveal itself gradually as one walks through it; a processional sequence of the public spaces leads from street to courtrooms. Surrounding the three-story core is a six-story "jacket" of support space, whose exterior walls form the building's street facades. While a feeling of openness is created on the side facing the water, the street side has a more severe appearance, a perception increased by the building's isolation amid relatively vacant surroundings.

However, the detailed granite-trimmed red brick, which provides a relatively inexpensive material, says Cobb, also refers to 19th-century commercial structures a few blocks away. In addition, the city plans for the area to become a new business, commercial, and residential center, and a new subway line will stop at the courthouse. *Jonathan Hale*

## THE SMITHSONIAN'S INDIAN MUSEUM: MULTIPLE AGENDAS, MULTIPLE PROBLEMS

Upon receiving the commission to design the Smithsonian Institution's new National Museum of the American Indian, Canadian architect Douglas Cardinal moved to Washington, set up shop, and prepared to construct the consensus required to get something built on the Mall.

Instead, he became mired in the agendas of multiple agencies which, he contends, threaten to compromise the integrity of his design and drive his office into bankruptcy. His only recourse, he was advised, was to withhold the drawings while negotiating for a larger fee and the right to continue his role in the building process. As a result of his actions, he has been fired.

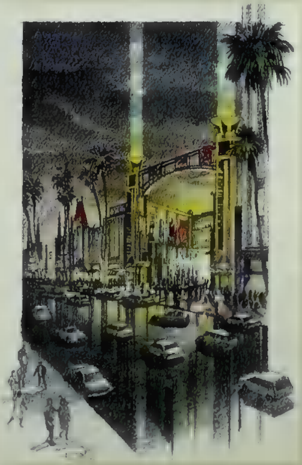
The Smithsonian, in a statement, maintained that Cardinal "failed repeatedly to meet contractual performance requirements" and that he was unlikely to be able to "meet those requirements in the future." The agency has retained New York architect James Stewart Polshek to complete working drawings and to oversee construction.

Cardinal, who cites Bruce Goff and native culture as major influences on his work, asserts that he must remain involved throughout construction. "It's like painting half a painting," he said, "and then they come along and say someone else is going to finish it, but don't worry, we'll still give you credit for it." The drawings are completed and stored in his firm's computers.

The Smithsonian, however, argued that "the creative phase of the design process...is finished," and what remains is the administration of contract documents, which is separate from design.

Cardinal remains hopeful that the rift can be repaired and that he will be allowed to continue with the project. "I hope," he said, "that the design and our technical expertise will be honored and that we will be reimbursed." The resolution, observers note, may set a new precedent for the design and execution relationship between architects and public clients. *Ellen Sands*

**AND THE OSCARS GO TO: THE ROCKWELL GROUP** **After two decades of shuttling between the Shrine Auditorium (near USC) and the Dorothy Chandler Pavilion (in downtown Los Angeles), the Academy Awards are going back to Hollywood. Starting in 2001, the statuettes will be doled out in a new auditorium on Hollywood Boulevard built just for that purpose.**



**New York's Rockwell Group is designing the theater, a flexible construction that will host up to 3,300 people on Oscar night—with a high-tech "media cockpit" situated in the orchestra—and seat 2,000 for other performances during the year.**

**In a situation that has been likened to Times Square, Hollywood has fallen on hard times of late, with corrosion replacing glamour. However, as is the case in New York, the city is boosting redevelopment and touts $1 billion worth of planned projects. The Oscars theater is part of a $350 million development project by the TrizecHahn Corporation that will also include restaurants and retail outlets.** ***S.L.***

**Designing the Peace Dividend** **Converting from a wartime mentality does have its challenges. A huge number of military bases—from 19th-century outposts to Cold War relics—are closing around the U.S. and in Europe, with the Pentagon decommissioning 200 in the last 10 years. Communities are now looking at adaptive reuse; here, three solutions.** ***S.L.***

## WATERTOWN ARSENAL TRADES WEAPONS FOR OFFICES AND A PUBLIC PARK

A design team has been put together to adapt the historic Watertown Arsenal, near Boston, for reuse. As a result, the 19th-century complex will soon become offices, community facilities, and a public park. Construction is scheduled to begin in October and be completed the following fall.

The architects are Bruner/Cott & Associates of Cambridge, Massachusetts; Thomas E. Hall & Associates of Wayne, Pennsylvania, are the consulting architects; and the developer is O'Neill Properties of Philadelphia. Dan Kiley, the landscape architect, plans to preserve the turn-of-the-century landscaping by the Olmsted Brothers.

For almost 200 years the arsenal has practically been an island, housing the workings of a secretive industry that was off-limits to the nearby village. The reuse plan changes that by opening the site to the public; plans include a new theater and arts center in one of the 19th-century buildings, as well as the renovation of an 1850s Italianate commander's house.

Total redevelopment cost for the project is estimated at $90 million. In addition, the revamping of the site required a $100 million environmental cleanup by the Army, including the demolition of a small nuclear reactor.

The 37-acre site borders the Charles River, across from Boston. Its most prominent building is the 900-foot-long Erecting Shop (below), constructed in two 450-foot phases for World War I and World War II.

Bruner/Cott—who are working on two other large-scale adaptation projects in Massachusetts—see their task as preserving the history of the complex while making it attractive to modern businesses. The architects must also mediate the tension between the military toughness of the buildings and the pastoral site.

Another area of the arsenal was converted in the early 1980s, when several structures and the surrounding land were turned into a shopping mall, health center, housing, and public park. *Jonathan Hale*

## A LITTLE SOMETHING FOR THE KIDS: OLD HANGAR IS NOW A MUSEUM

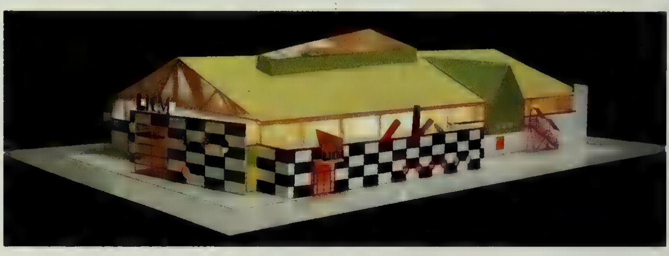
An abandoned World War II airplane hangar on Long Island's Mitchell Field has finally found a peacetime occupation as a children's museum. New York City–based Gran Sultan Architects is handling the renovation and expansion of the structure, near Garden City, which will house 12 galleries, a 150-seat theater, a store, a classroom, and 3,000 square feet dedicated to toddlers when it opens in 2000.

The privately funded Long Island Children's Museum is the first museum for principal Joe Sultan, whose municipal projects have often packed innovative design into tight budgets—in this case, $100 a square foot.

Sultan views the financial constraints as a way to keep focused on the mission of the museum rather than the details of the design. "We're working to develop a clear, dynamic circulation system enhanced by two-story volumes, daylighting, and exposure of the existing structural system," he says.

The exterior (below) will present a traditional scale to those approaching from the outlying complex but a kid's scale up close.

The Long Island Children's Museum is one of three under development at the Museums at Mitchell Center. Also planned are aerospace and firefighter museums. *Julie Moline*



## ADAPTING U.S. AND SOVIET BASES IS TRICKY BUSINESS IN GERMANY

The two sites could not be more different: one is a sturdy, well-maintained industrial complex, the other an assortment of stripped and decrepit buildings. Situated several miles apart on either side of the Berlin Wall, they once housed soldiers trained to kill each other. Now they are destined to house the legions marching from Bonn to Berlin as Germany shifts its capital.

Germany is densely populated, and absorbing huge swaths of land has been a weighty political issue. The fates of the former McNair Barracks—once headquarters for U.S. troops—and the abandoned Soviet army barracks in Karlshorst are typical of the tedious process of redeveloping the installations used by Germany's former occupiers.

Both sides left environmental messes, but the problem is critical in the east. Surface areas of the former Karlshorst base have been cleared of fuel and munitions, according to a redevelopment spokesman, and underground contamination will be treated during construction. A recent competition resulted in a plan for about 1,000 housing units, mostly apartments, with supporting retail, but bids have not been taken from developers.

Whether and how to preserve elements of the Nazi and Communist eras are also issues that plague planners. Most of the Karlshorst barracks will be razed, but other parts, including a Lenin monument, will be saved.

At McNair, much of the industrial complex, designed in the 1930s by Hans Hertlein, will be renovated, though entirely new housing will be built. *Chuck Twardy*

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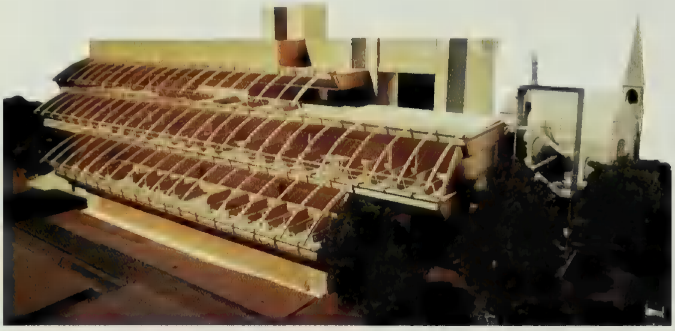


## VINOLY'S LABORATORY DESIGN IDEA: KEEP THE RESEARCHERS HAPPY

With a goal of expanding the frontiers of medical research, the Van Andel Institute is creating a new $200 million headquarters at its base in Grand Rapids, Michigan. The institute has four Nobel laureates as scientific advisers, so it's not surprising that it searched worldwide for an architect who would push beyond traditional research lab design. The choice turned out to be Rafael Viñoly Architects of New York City.

Construction began in March on phase one: a 150,000-square-foot space that includes research labs, conference rooms, and a 350-seat auditorium.

The area will open by 2000, and work will then begin on phase two, which expands the research space and conference facilities and adds a cafeteria and parking. The completed institute will be 400,000 square feet.

Architects at Viñoly inspected many other labs and found that most had too few windows. As a result, daylight is an important part of the new design, with a five-story, vaulted glass roof over the research space as one of the most prominent elements.

"The challenge was to make the most flexible building possible," says Jay Bargmann, AIA, project director at Viñoly. As an example he cites the research space: the lab furniture is on wheels and has built-in lights so it can be easily rearranged for group or individual projects.

An informal gathering space and a cafeteria are included in the atrium, which Bargmann calls "the civic space at the heart of the building." The idea: simply to encourage researchers to talk to one another. *Susan R. Bleznick*

## DRAMATIC ARCHES ON THE RISE IN BARREN OUTSKIRTS OF MEXICO CITY

The Los Arcos Bosques complex, now rising next to a highway outside Mexico City, is Latin America's most ambitious real estate project in terms of space, according to its developers, with more than 5 million square feet of residences and offices under construction.

The mammoth buildings—two 525-foot arches within three inhabited walls—are a statement that the Mexico City–based architect, Teodoro González de León, along with architects Francisco Serrano and Carlos Tejada, hopes will carve a dramatic urban niche in what is now a dreary area.

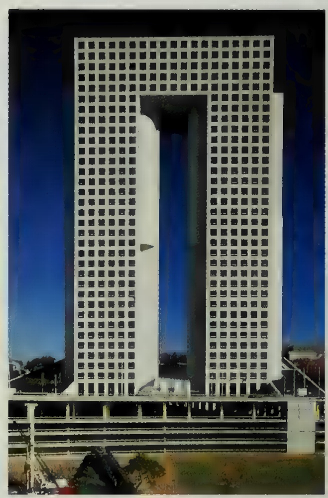
Each arch has two towers with thirty 10,000-square-foot floors; four 30,000-square-foot upper floors connect the towers at the top.

The floors are built in a free-plan design, with service and circulation cores running along the building's exterior. The windows, three meter squares, form a pattern of stamps across the white chiseled concrete.The forms are meant to be simple and autonomous, according to the architects, and invoke gravity and solidity.

The slope on which the buildings rest—a man-made inclined plane reminiscent of pre-Columbian temples—anchors the complex to the terrain.

González de León, who also designed the upcoming Mexican Embassy in Berlin, brings extensive experience in public building to this privately funded project.

As a result, Los Arcos has common spaces, like waiting areas and plazas, that "monumentalize" the mundane architecture typical of most corporate headquarters.



The arches will serve as a new reference point as the city grows outward, the only context in an otherwise barren landscape. The first arch is now complete and the second will be constructed by 2001. *Miquel Adría*

**THE FRENCH STROLL IN A NEW PARK** **The newest green space in Paris, le Parc de Bercy, is nearly complete. Designed by FFL architects along with Bernard Huet and landscape architect Ian de Caisne, the park is roughly the size of the renowned Tuileries—but very different in design scale.**

**The 33-acre space is also the focal point of the redevelopment of Bercy, which was the center of the French wine trade for several centuries. Only a small section of the original warehouses remain, and Frank Gehry's American Center, built in 1994, is closed, depriving the new neighborhood of a cultural magnet. Still, Bercy is largely considered a success, and the government-subsidized apartments are filling up quickly.**

**The designers of the park preserved the stone crossroads embedded with rails (for transporting wine) and used them for an organizing grid. They then created a succession of garden environments, moving from the westernmost green "prairie" to nine themed squares, which include vegetable and herb gardens and an orchard. Four other gardens evoke the seasons, while waterfalls, a canal, and a grotto complete the eastern zone.**

**To see the Seine, park visitors climb a monumental stairway up a wall that buffers the park from a busy riverside expressway. The wall, harboring maintenance facilities and parking, serves to cut sound levels from 100 decibels down to 60 inside the park.** ***Claire Downey***

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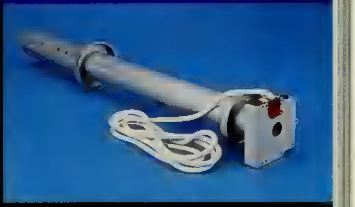

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## TURKEY GETS DOSE OF NEW URBANISM WITH AMBITIOUS SITES NEAR ISTANBUL

By applying what is an essentially American small-town ideal to the planning of affordable, high-density communities in Turkey, Maryland-based CHK Architects and Planners is testing the limits of New Urbanism.

The conditions that inspired the New Urbanism movement in the United States—suburban sprawl and severe apartment slabs—also exist in Turkey, especially in Istanbul. Unlike the experience of American cities, however, Istanbul is also burdened by a prolonged housing shortage.

Housing construction in the past 40 years has never met demand, while the population of the city has grown from 1 million to 12 million. Around 30 percent of new housing starts are *gecekondu*, squatter-built homes that, despite violating safety codes, are allowed to stand if they are built in one night.

CHK's first New Urbanist experiment in Turkey was a small resort community in Istanbul, which didn't allay the frequently voiced criticism that connectivity, a strong public realm, the integration of mixed uses, and an emphasis on traditional styles are luxuries.

Nevertheless, CHK wanted to prove that its approach was a sensible solution to Istanbul's urban woes. There are no phobias about density there or about living over a restaurant, says CHK president John Torti, suggesting that his firm's ideas may make even more sense in Turkey than in American cities.

The architects have done master planning and designed 2,300 units at Bahcesehir, a hillside town outside Istanbul. Commercial and civic functions are concentrated at the bottom of the hill, and parks, fountains, and vistas abound throughout.

The homes were built in the Ottoman vernacular, but the architects resorted to a new housing type to deal with the difficult slope of the site. A three-story house entered at the bottom of a hill is topped by a three-story house entered farther up, an arrangement inspired by the wood-framed houses that abut the wall of Istanbul's Topkapi Palace. This system, combined with the double loading of streets, allowed for a heavy concentration of units.

There was also a wide range in size and pricing, as dictated by the client, a government-owned bank interested in quality housing choices for a growing middle class.

Ispartakule, an even larger town planned by CHK (above), will break ground near Bahcesehir by the end of the year. It will eventually house 65,000 people, including the residents of a *gecekondu* neighborhood that will be integrated into the town and its infrastructure.
*David Simon Morton*

## DEVELOPERS MAKING THEIR PLAY FOR GIGANTIC INFILL IN DENVER

When Denver International Airport opened in 1995, Stapleton, the city's old airport, became the nation's largest urban-infill site. City officials were thrilled at the prospect of developing such a large parcel of land relatively close to downtown.

Denver Mayor Wellington Webb created the nonprofit Stapleton Development Corporation to devise a comprehensive plan for the site, which covers 4,700 acres on the prairie just east of town. The resulting design—produced by New York–based Cooper, Robertson & Partners and five other firms—has already won several awards, including the 1996 President's Award for Planning from the American Society of Landscape Architects.

But other than a few commercial buildings, Stapleton remains largely undeveloped.

That's about to change. Later this year, SDC will begin selling off sections of the property to private developers. If all goes according to plan, the former airport will be transformed into a mixed-use extension of the city (partial view below) containing thousands of New Urbanist–style homes, schools, and businesses, as well as 1,700 acres of parks, trails, and open space. One interesting feature will be 365 acres of restored prairie sand dunes.

When the development is completed in 30 years, it will be home to 25,000 new residents.

"This is a unique opportunity for Denver," says Tom Gleason, SDC's director of community and government relations. "Not only is it a large site, but it's also right in the heart of the metropolitan area."

Steven Walsh, AIA, an associate with RNL Design, says he and others are watching the project closely to make sure the city and private developers don't stray too far from the plan. "We don't want to see the whole process subverted by shortsightedness," notes Walsh.

Meanwhile, several other infill projects are taking shape. The closed Lowry Air Force Base is being redeveloped into a mixed-use community, and on the other side of town developer Chuck Perry wants to turn Elitch Gardens, former site of an amusement park, into 38 acres of traditional-style housing.

Perry has hired Calthorpe Associates of Berkeley, California, to design an "urban village" that would blend in with the surrounding neighborhood, which contains mostly 60- and 70-year-old brick bungalows.

Perry promises to incorporate the landmark Elitch Gardens Theatre, built in 1890, into the development. "We've really let the historic and natural features of the site guide the design," Perry says.

On March 17, the city council voted 12 to 1 in favor of the plan to redevelop Elitch Gardens.
*David Hill*

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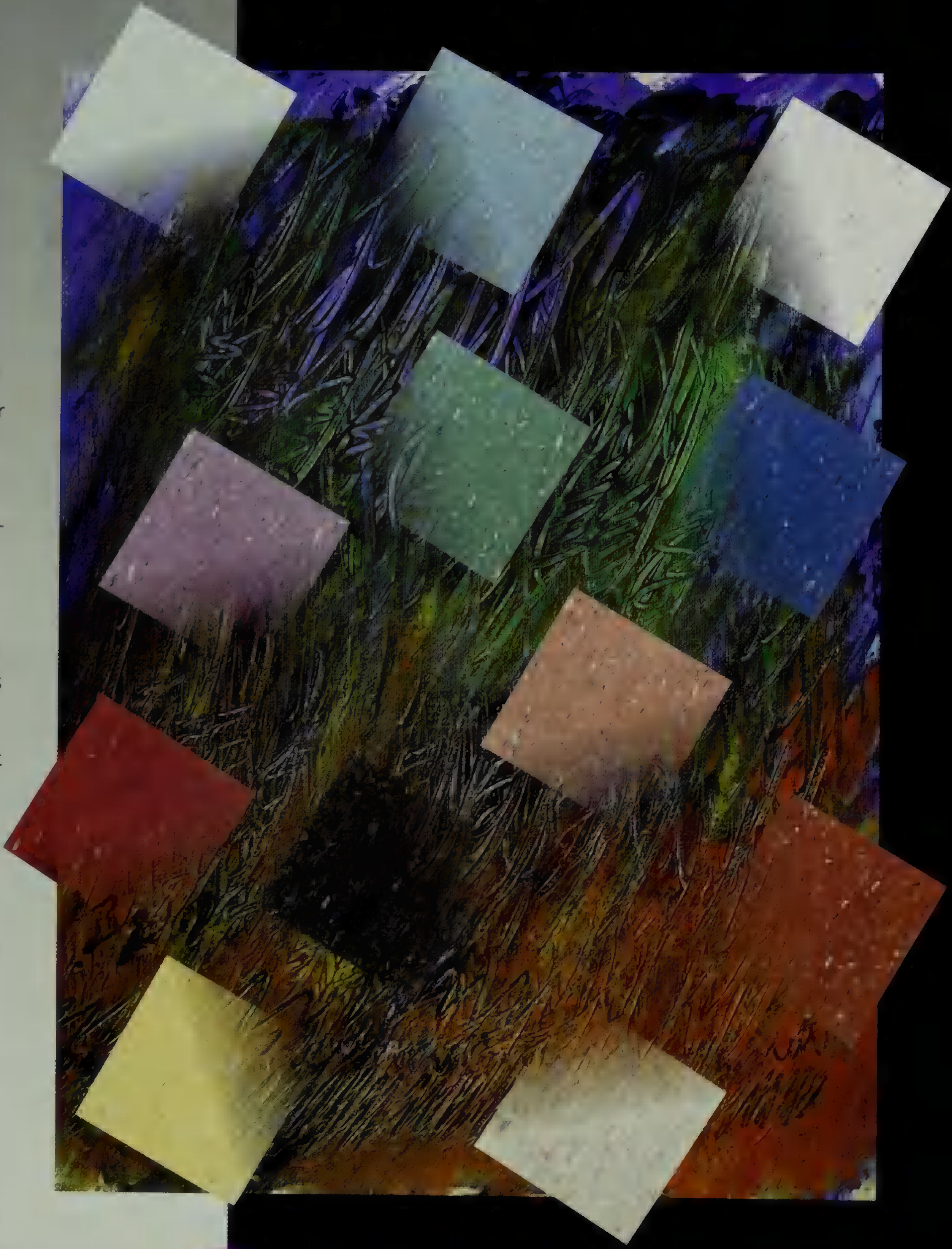

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## AT THE CROSSROADS OF THE WORLD, A FACELIFT IS IN FULL SWING

It's been 15 years since the vision of Times Square as a corporate office park was proclaimed, and almost a decade since that vision became mired in recession and battles to preserve the area's historical character as an entertainment mecca.

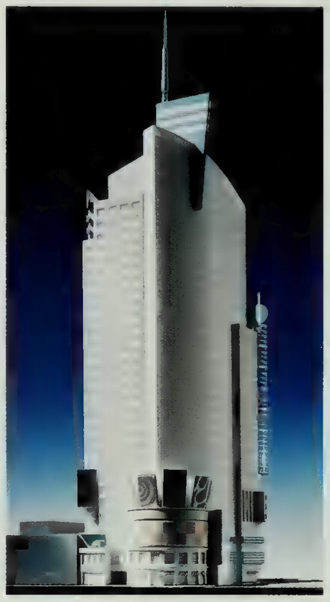
Now, design and construction are moving ahead on a dizzying number of projects—thanks to a stronger economy, risks taken by early investors, and optimism about Times Square's potential.

In the latest news, the rights to the last two sites among the planned quartet of office towers have been sold by the Prudential Insurance Co. A partnership of Boston Properties, the Blackstone Group, and Park Tower Realty will break ground in 1999 on these two buildings, although architects have not been selected.

Meanwhile, the much-discussed 48-story Condé Nast building is rising at Broadway and 42nd Street, while its architects, Fox & Fowle, ready their plans for the Reuters building, to be built across the street on Seventh Avenue. With the Rudin Organization as the developer and Swanke, Hayden, Connell Architects designing the interior, the 855,000-square-foot tower (right) is due for completion in 2001.

Fox & Fowle's idea was to link the building with the revitalized entertainment row along 42nd Street. The 30-story east facade presents a corporate face, with its sleek glazing curving west onto 42nd and into a seven-story, drum-shaped rotunda to draw pedestrians around the corner.

The terra-cotta and carved-stone facades of the drum, a low-rise retail space, and the 20-story north side retain some of the character of nearby buildings, including renovated theaters.

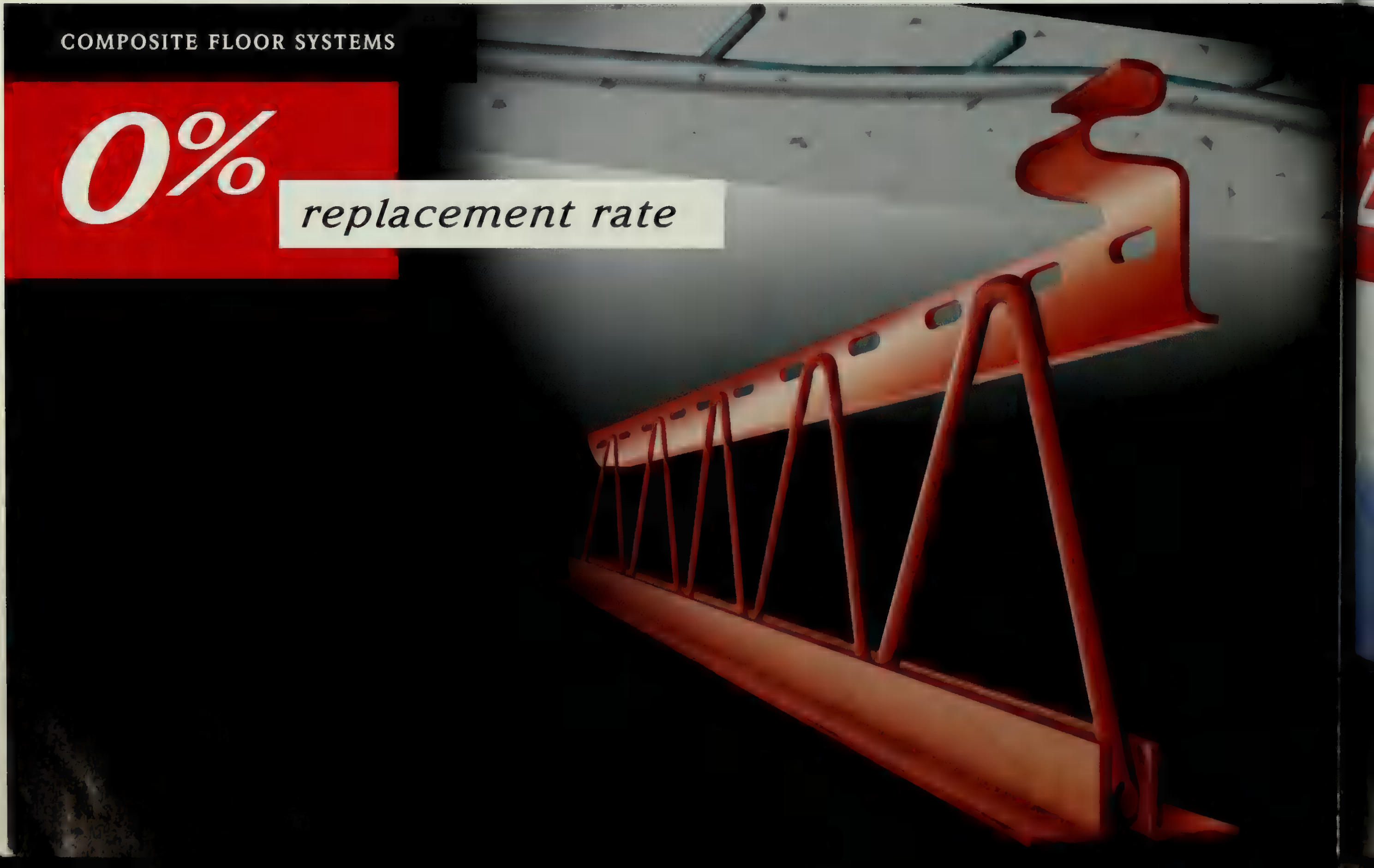


The design is an intentional "pastiche," says partner Bruce Fowle. "Times Square has always been about layering, not about architecture."

Signage integrated into the architecture includes a wedge-shaped rooftop finial identifying Reuters, news zippers that flow from within the lobby out around the exterior, and a three-story video monitor. A 14-story cylindrical "spectacular"—a large-scale electronic display—at the northeast corner announces the building to traffic entering Times Square.

Meanwhile, under construction a block away at 42nd Street and Eighth Avenue is Tishman Urban Development's E Walk, a retail, entertainment, and hotel complex. The hotels, designed by the Miami firm Arquitectonica and costing $230 million, include an 800-room, 45-story tower and a more intimate 100-unit establishment that provides a formal transition between the tower and the retail base.

With only a half block on which to fit 650,000 square feet, the designers avoided a potential monolith by slicing a curving, vertical ribbon of light through the length of the tower and vertically shifting the resulting sections. *Andrea Truppin*



# NEW FACE OF NICOLLET MALL HAS TWIN CITIES IN TURMOIL

Amid the latest development boom that finds construction cranes dotting the downtown Minneapolis skyline, some preservationists and critics are alarmed that three recently announced large-scale projects along the historic Nicollet Mall shopping district are threatening the low-scale, pedestrian-friendly character of the mall's south half (right).

Under construction is a 14-story corporate headquarters for discount retailer Target, designed by Minneapolis-based Ellerbe Becket as the first of a proposed two-phase project that will include an entire block. To the north, Minneapolis-based Ryan Companies has proposed building a Target store to fulfill the city's goal of bringing more moderately priced retailers downtown.

In addition, demolition teams have imploded a failed 10-year-old retail mall, The Conservatory on Nicollet, to make way for a 30-story, 910,000-square-foot headquarters—also designed by Ellerbe Becket—for the investment firm Piper Jaffray Companies Inc.

The north end of the mall succumbed long ago to large-scale development, but the south has retained many of its older, low-rise buildings—and their demolition could quicken the loss of the area's vanishing human-scale character.

Robert Roscoe, head of a preservation-design firm and a member of the Minneapolis Heritage Preservation Commission, calls the razed structures on the south mall "background" buildings that gave people pleasure and comfort. "Their demise is a great loss to the city," he says. "They had a tactile, close-to-the-eye relationship to people on the sidewalk. Downtown Minneapolis, unfortunately, has an insatiable appetite for retooling itself and erasing its architectural history."

Martha Frey, an independent preservation consultant from Minneapolis, notes, "What makes the mall interesting is the diversity of old and new. These smaller buildings are often seen as a kind of stumbling block [to developers] rather than as an opportunity to do something creative."

Ellerbe Becket did design the two new office buildings with Nicollet Mall's retail heritage in mind. The Piper Jaffray Center, sheathed in light-color stone panels and glass, will include two levels of retail outlets when it opens in June 2000, while the Target headquarters, clad in stone and glass at the base with precast and glass above, promises retail on the first level when it opens this fall. *Eric Kudalis*

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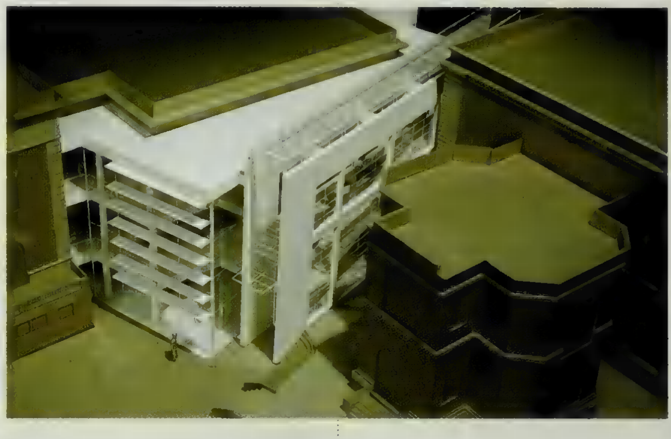
* Number of hurricanes that hit the Atlantic basin from 1995 to 1997.

## NEWS BRIEFS

**Thompson, Western pioneer** Elisabeth Kendall Thompson, who worked for over 30 years at ARCHITECTURAL RECORD and was a major figure in Californian architecture, died late in March at age 87. After two years apiece at Tulane and the University of California studying architecture, Thompson began her career at RECORD in 1937 in the New York office. She took time off for motherhood before resurfacing in Berkeley in 1947 to start the magazine's Western edition. Thompson retired in 1975 as Senior Editor, but she maintained a steady schedule of serving on local and national AIA committees along with juries and boards. A crowning achievement was being named a Fellow of the AIA, only the ninth woman to be bestowed that honor.

**Favorable response** To gauge whether architects support the expansion of its multimedia advertising campaign, the AIA has been conducting an on-line survey. At last count, 72 percent of respondents favored the proposal, which the AIA says would produce greater public appreciation of the profession. The expanded campaign would include television and additional radio ads.

**Lobbying effort** The Albany Institute of History and Art is set to build a connecting lobby that will also serve as its new main entrance. Construction is scheduled to begin this summer on the glass, aluminum, and limestone lobby, which will bridge two existing Beaux Arts structures, built in 1894 and 1908. Architects for the project are Solomon + Bauer Architects Inc. of Watertown, Massachusetts, who emphasized the primacy of the new portal by creating a new diagonal axis from the street to the entry. Two parallel walls clad in limestone define the new circulation spine, while a monumental staircase connects the building's three levels, where a collection of primarily American painting and sculpture is housed. The new lobby is part of a $9.5 million restoration that will also include a second new structure to house mechanical equipment, along with conservation facilities and a loading area.



**Albany's Modernist addition.**

**Health matters** As the population gets older and health care demands change, innovative facilities are needed to treat specific lifestyle requirements. The Pratt Planning and Architectural Collective kept that in mind in designing the Housing Works Adult Day Health Care Facility, which opened in Brooklyn in March. The residential facility—which received funding from HUD and the New York Department of Social Services—includes efficiency apartments, a

*(continued on page 88)*

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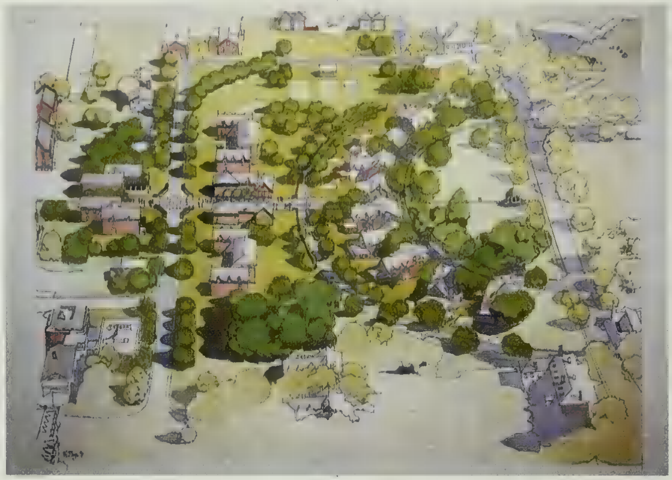
(continued from page 86)

clinic, and a café, using materials that are typically found in affordable housing rather than hospitals.

**It takes a village** The athletes' village for the 2002 Winter Olympics in Salt Lake City, Utah, presents a challenge, as it must meet multiple design criteria. In addition to being sensitive to the needs of 2,400 international athletes, the architects must keep in mind that the site is eventually intended to be converted to a learning environment for the University of Utah. Another significant challenge is the need to integrate the construction with the fabric of Fort Douglas, an Army post built in 1862. The Norfolk, Virginia, firm Hanbury Evans Newill Vlattas is in the design phase (working with Architectural Design West, a Salt Lake City firm). The village's 27 buildings—totaling about 910,000 square feet—will include residential, dining, academic, and community-support facilities in two-, three-, and four-story units, interspersed along an elliptical green space with intersecting walkways.



**HENV's Olympic vision.**

RENDERING: HENV

**School days** The University of Texas has rechristened its art collection the Jack S. Blanton Museum of Art, raised $35.5 million in an endowment campaign, and initiated an international search for an architect to design a major new building, slated to be built by 2002. In other news from academia, Douglas S. Kelbaugh has been named dean of the University of Michigan's College of Architecture and Urban Planning.

**Priming the Pentagon** In the first significant change to its exterior since it was built 55 years ago, the Pentagon will renovate the core and shell portions of what it calls wedges 2 through 5. Hayes, Seay, Mattern & Mattern has the design contract for the 5.4 million-square-foot project, which will be completed over the next three years and will cost a hefty $1.1 billion.

**Clean living** One of London's priorities has been to reduce congestion. To wit, a new residential development in Soho, designed by CGHP architects, will be the first car-free housing scheme in the city. The project comprises 29 homes with gardens on the ground and on a communal rooftop.

**Honor roll** At its annual convention this month, the AIA is conferring three Institute Honors, which reward achievements that benefit the built environment and the architectural profession. The recipients are Lian Hurst Mann, AIA, Ph.D.; William N. Morgan, FAIA; and the Skidmore, Owings & Merrill Foundation. ■

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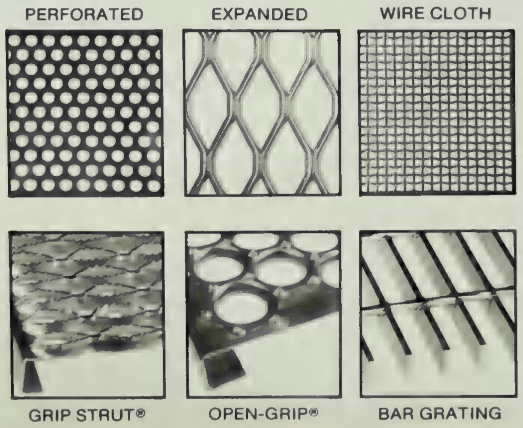

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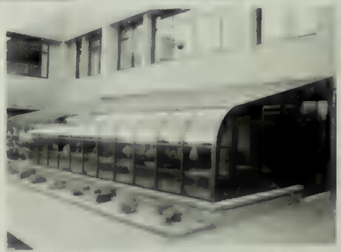

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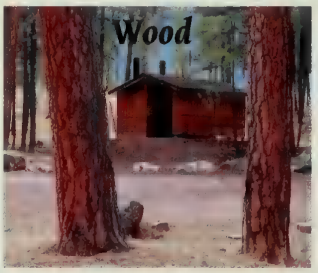

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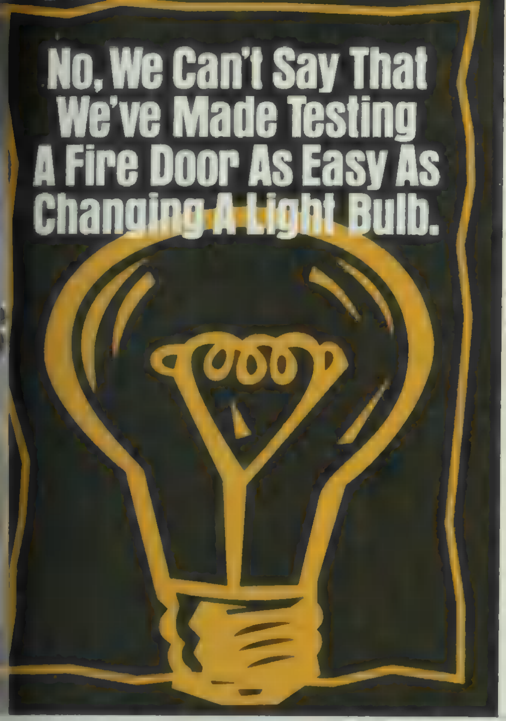
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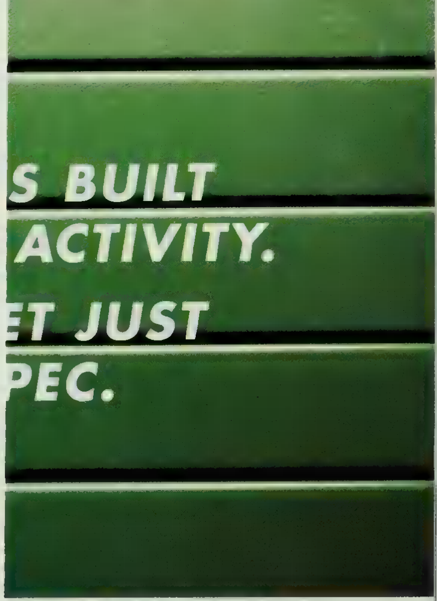

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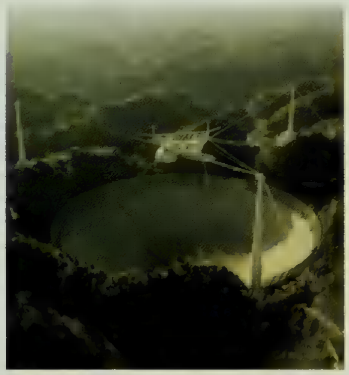
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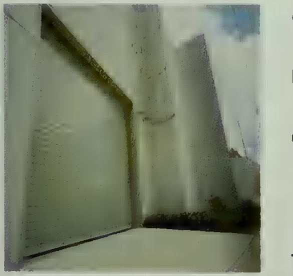
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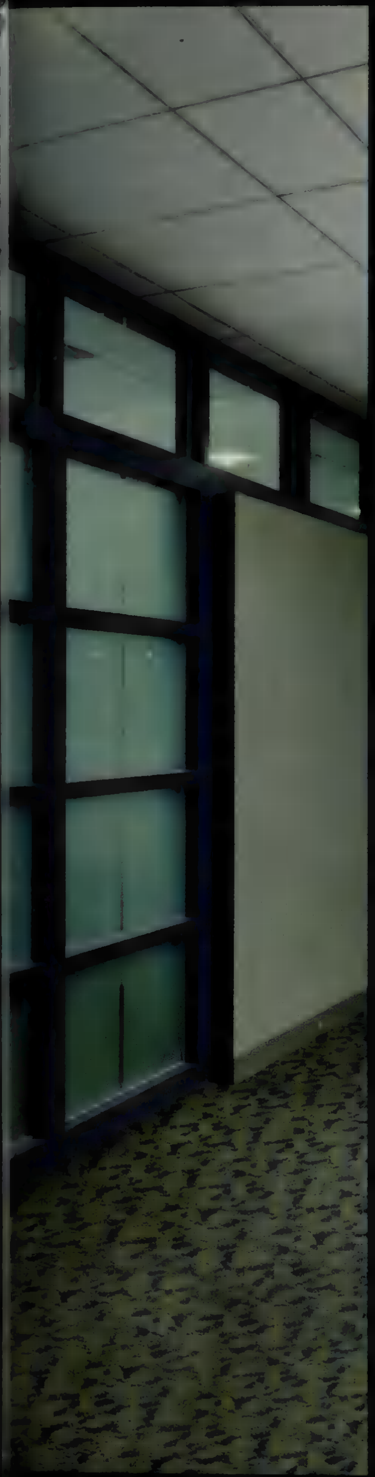

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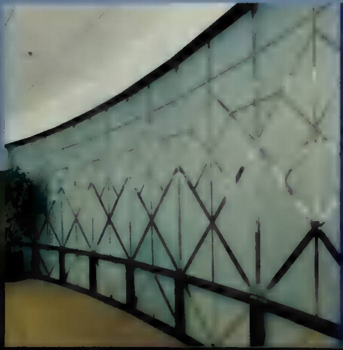

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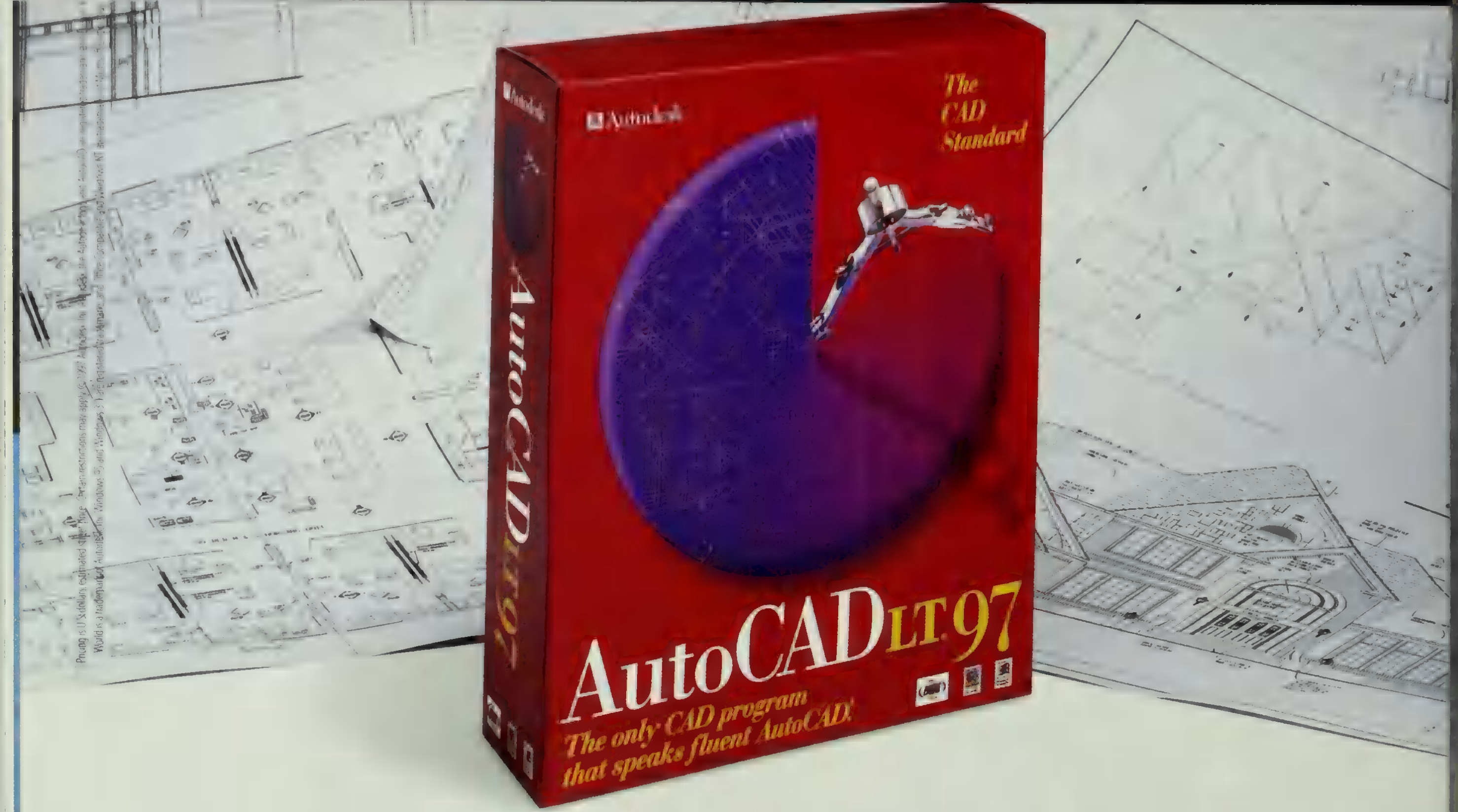

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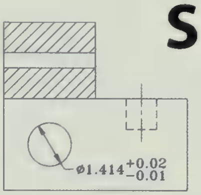

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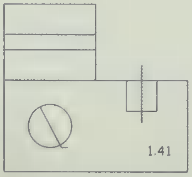

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architecture
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firm award
25-year award

# American Institute of Architects 1998 Honors & Awards

*Architectural awards programs are like snapshots, offering intriguing views of the profession and design culture at a particular time. And, like photographs, they can be both misleading and remarkably true, catching architecture at awkward moments or at its most appealing. To offer some perspective on this year's family portrait,* ARCHITECTURAL RECORD *asked a distinguished foreign critic and architectural historian, William J.R. Curtis, to look at the 1998 AIA Honor Awards winners and analyze what they say about American architecture today. Curtis brought to the assignment an interesting background, having finished the demanding job of updating his landmark 1982 book* Modern Architecture Since 1900, *essentially rewriting his own version of modern architectural history.*

*Curtis delineates interesting differences in approach and style between American architects and their counterparts in developed countries in Europe and Asia. The most important of these relate to designs for the public realm and the situations in which American architects will (and will not) use Modernist forms. He also examines American designers' relationship with history, technology, consumerism, and the concept of nature.*
—Clifford Pearson

# **WILLIAM CURTIS** compares design in other nations with this year's **AIA AWARD WINNERS** to gain perspective on American architecture.

**by William J.R. Curtis**

It is hard to know if the 1998 AIA Honor Awards offer a representative cross section of recent tendencies in North American architecture. But if they do, they reveal a curious state of affairs, in which Modernist abstraction is apparently reserved for exclusive penthouses, woodland retreats, and spiritually uplifting environments (whether religious or artistic), while more traditionalist schemes of representation and historical models are to be found in the street, the urban institution, the university, and the realm of affordable housing.

It is not certain what this says about contemporary American society, but it clearly reveals a different set of priorities than those in, for example, France, Finland, Spain, Holland, Switzerland, and Japan, where diverse cultures of modernity have a much wider social basis and a relative degree of support from the state. In fact, a cross section of recent European awards (such as the Spanish Biennale of 1997 or the Finland Builds exhibition, which takes place every five years) would reveal how Modernisms or neo-Modernisms of various kinds have functioned in the public realm for a broad range of building types, from schools, gymnasiums, churches, and museums to subsidized housing. At the same time, there have been subtle accommodations to place, history, and topography, but without an agonized pastiche of past models.

**Ellen Wilson Neighborhood by Weinstein Associates**

In the United States today there is an apparent caution and lack of experimentation in the civic domain, which perhaps reveals both cultural conservatism and a lingering dismay at the disastrous impact of urban renewal 30 or more years ago. I do not know if it is by chance, but of the institutional works given awards in 1998, many are renovations or restorations. Even with new buildings there is an evident desire to make them look (sort of) old. Especially in cultural precincts like universities, contextualist pieties continue to hold sway. The desire to fit in sometimes results in tired imitation of historical neighbors.

Where urban housing is concerned, there seems to be an implicit belief that the old pattern languages are the safest ones to follow. The terms of the debate were fixed in caricature long ago: anything resembling a freestanding slab is bad; anything resembling a traditional street with facades and front doors is good. A whole range of intermediary research into modern reinterpretations of the enclave, the court, the cluster, and other types of aggregation is largely ignored. As for the sort of avant-gardist experimentation that one finds in the housing sector in the Netherlands, for example, there seems to be no equivalent in the recent honor awards, or in U.S. production generally. In fact, the American avant-garde (such as it is) has retreated into the arms of one of its traditional enemies, academia. Here it spends much of its energy avoiding social realities and withdrawing into arcane theoretical discourses.

There is nothing new in raising the problem of the consumerism of images, but in the United States, commercialism and populism have enjoyed a free exchange in the marketplace for some time. It is noticeable that when architects are addressing less-well-off sectors of the community they resort to architectural "signs" and recognizable imagery. By now the Postmodernist clichés of yesteryear have gone full circle to become a common currency in the main street from which they were supposed to have sprung. While sentimental urban designers and academics cling to some cherished notions of "civic values" through an updated version of "realism," the actual street of the American downtown gradually transforms itself into a species of suburban mall without a roof, or else a theme park of historical clichés.

### No tech, please; we're American

It is fascinating to see how different societies deal with images of technology. Recent American work, even in the commercial sector, is squeamish about "high-tech" expression. It is curious too how absent skyscrapers are from the current scene. Fifteen years ago the tall building stood at the center of a boom, and much of the critical chatter had to do with the look of the skyscraper (though very little with its substance or anatomy). In the 1990s one sees more rehabs of old buildings and more out-of-town office parks with pastoral pavilions decked out with romantic, overhanging roofs.

As for Nature, that great abstraction tied to North American notions of the ideal life in suburbia and beyond, it seems to have been recast as a great consumable for the uprooted inhabitants of the "information city." Nature has become a sort of New Age generalization, combining a vague spirituality with soothing sensations of landscape and materiality and a well-wired escapism into the "wild." Nature for the rich may mean the flood of light onto silent abstract surfaces in apartments suspended above the mess of the city (inner landscapes of a kind), or else it may mean lyrical scenarios deep in the woods, with echoes of vernacular archetypes. The public space between the penthouse and the rural retreat exists, increasingly, in the virtual space of electronic communications from car to airport to portable phone and

*William J.R. Curtis is a British architectural historian and critic based in France. The third edition of his book* Modern Architecture Since 1900 *was published by Phaidon Press in 1996. He writes for a number of international design journals.*

Manhattan Rooftop Residence by Shelton, Mindel & Associates

computer. Tokyo is on the line, but the bombed-out park near the freeway is scarcely noticed.

These are some of the signs and symptoms of a technological society in which electronic gadgets and networks are redefining the very notions of public and private, urban and rural, cosmopolitan and regional. Similar things are happening in other postindustrial societies, but take different forms and represent different styles of modernization. In France, for example, modernity is virtually an affair of the state, which has tried to articulate a progressive vision through statements of technocratic monumentality (as in the *grands projets*). In the United States, a building like Dominique Perrault's "*très grande bibliothèque*" in Paris is unthinkable. In North America the state does not get much involved in modern architecture of any kind; glass skyscrapers contain private and commercial activities (if they are built at all); and bold statements of technocratic rhetoric are, for the moment, regarded with suspicion.

### A gradual assimilation of early Modernism

I have no intention of turning this essay into a diatribe on the evils of privatization and free-market capitalism. But one does need to be aware of the forces at work, including the largely unconscious hold of architectural tradition. American architectural culture undergoes constant disjunctions and jolts of fashion, but there are also continuities and realignments as new paradigms are taken into account, absorbed, or rejected. Despite the ruptures of Postmodernism (much less drastic than some thought at the time), and despite the claims of radical innovation in the avant-garde, the actual buildings bear witness to a much more gradual assimilation of earlier phases in the history of modern architecture than is usually admitted.

Take those minimalist penthouses bathed in white paint. In one there are echoes of Mies, in another references to Le Corbusier, in another analogies with Tadao Ando. By coincidence, I happened to go to a party in one of this year's honored apartments the same day that I saw Richard Serra's amazing *Torqued Ellipses* at the Dia Foundation in New York City. This competition would be overwhelming for virtually any living architect, but the comparison prompted a reflection on the reemergence of interest in abstraction in recent American architecture. Indeed, the minimalist apartment seems to have joined ranks with Modernist furniture and modern art as a sort of collector's item. For example, the Park Avenue Apartment by Frank Lupo and Daniel Rowen (page 121) is characterized by the architects as "a meditative landscape, radically separated from the city around it, in which the occupant can explore the senses without encumbrance, a place to listen to the light, see the silence, and dream." Even the client's "intended art collection" was not included as he "determined that the play of light against the composition of planes of walls, floors, and ceilings satisfied his aesthetic agenda."

To the observer accustomed to acres of drywall on interiors and skin-deep veneer on facades in American buildings, it is gratifying to see a number of selected projects dedicated to an exploration of the tectonic presence of material and the expression of construction. One of the most subtle is the renovation of MIT's School of Architecture and Planning by Leers Weinzapfel Associates, with its inserted layers of transparency relying on a reductivist language of steel-framed glazing (page 123). A different example is the Becton Dickinson corporate villa in suburban New Jersey, for which Kallmann, McKinnell & Wood developed a palette of "brickwork and copper carefully fitted to the forest and topography of the site" (page 109).

Near Boston's Logan Airport, there is a remarkable work that contradicts some of my earlier generalizations, since it is technologically adventurous, aesthetically convincing, monumental, and in the public sector: Ventilation Building No. 7 (page 112), designed by Stull & Lee; Wallace, Floyd, Associates; and TAMS Consultants. Here engineering serves as a springboard for powerful architectural expression, but without the pictorial excesses of much recent high-tech design.

Private Apartment by Frank Lupo/Daniel Rowen, Architects

Atlantic Center for the Arts by Thompson and Rose Architects

Given the American tendency to rely simplistically on traditionalist schemes in housing, I must single out the Orange Place Cooperative in Escondido, California, by Studio E Architects (page 114); here an attempt has been made to reinterpret a local design tradition—that of Southern Californian bungalow courts. Like its predecessors, Orange Place takes advantage of a benign climate and mixes together buildings and outdoor spaces to create an affordable neighborhood. The formal expression is modest, while the spatial disposition reminds one of the underexploited wisdom lying latent in the patio tradition, running back to Rudolph Schindler's Pueblo Ribera Courts of 1924 and Irving Gill's work in the early decades of the 20th century.

### Adjusting to regional and international sources

Some 15 years ago regionalisms (critical and otherwise) were much discussed. While some of the most engaging of this year's projects deal with the problems of adjustment to particular landscapes and climates, it would be pointless to bracket them with any *ism*. Whatever their local inspirations and regional responses, they also draw on a wide range of cosmopolitan and international sources, in turn employing abstraction to effect a transformation. The Type/Variant House in Wisconsin by Vincent James Associates is a case in point (page 108). Aptly described as "an assembly of copper forms veiled by the forest," the project is made up of wood-framed, metal-clad volumes, each a variation on a basic geometrical theme. Abstraction is used to intensify the experience of a sequence and the mood of the place. Here minimalism and materiality evoke the geometries of the rural-industrial vernacular of the upper Midwest. There are memories of Frank Lloyd Wright in plan and detail, and in the feeling for nature.

Brandenburg's Ravenwood Studio in Minnesota (page 113), designed by David Salmela, also explores the question of an appropriate expression for the wilderness but with more overt references to vernacular form (both the Scandinavian heritage of immigrant rural architecture, and the original prototype of Viking longhouses). These are somewhat risky agendas, which could have ended up with a cloying rusticity or a ski-lodge cliché. But the architect seems to have kept control and come up with a solution that releases an evocative domestic space with ancient and natural echoes. The preoccupation with quotidian detail, timber slats, and forest views reminds one of recent Finnish architecture.

This theme of combining local and general finds yet another form in the dramatically contrasting setting of the semitropical coastline of Florida. The Atlantic Center for the Arts at New Smyrna Beach, by Thompson and Rose Architects, is arranged as a scattered sequence of timber structures along a boardwalk that meanders through the jungle as a raised social street (page 112). The individual buildings are angled to frame views, include or exclude light, respond to breezes or the rain. The vocabulary draws from the screens and perforated transparencies of tropical vernaculars, transforming the idea of a filter for light and air into a vocabulary of inflected fragments. There is a preoccupation with "intensified experience" through perceptual adjustments of surface, volume, plane, space, and material. The Atlantic Center for the Arts is a reminder that fragmentation (so often discussed as an expression of uprootedness) may also be used to ground a building in natural and topographical conditions. Although there are no direct references to Frank Gehry or Alvaro Siza, lessons from some of their work seem to have been absorbed.

One of Steven Holl's recurrent and guiding themes is the primacy of experience: the impact of phenomena on all of the senses through basic architectural means. Thus while Holl did not give way to the temptations of Postmodernism, he wasn't lured by the quick tricks of neo-Modernism either, preferring to explore a single-minded route grounded in his direct perceptions of architecture, art, and the natural world. Despite these commitments to a "poetics of space" and of "the thing itself," his results have sometimes seemed overintellectualized, though in recent years a distinct language and approach have crystallized.

The Chapel of St. Ignatius at Seattle University (page 110) explores both the sensations and the possible meanings of light in a spiritual center. The generating sketches of the scheme suggest a spatial idea unfolding around interpenetrating layers of natural illumination and filtered or reflected color. Holl reacts to the sacral function by reinterpreting some of the traditional means for handling ritual: procession, gathering, and the evocation of mood through overlapping, perceptual "veils." The building serves as spiritual center for the Jesuit community, and the architect has also explored the notion of "unity of differences gathered in one." But these metaphors are not stuck on; they are integral to the ideas of the work and communicate without being fully spelled out. One senses that Holl has drawn his lessons from Le Corbusier, Aalto, Kahn, and even Richard Serra, but the result is not a beguiling formalism: it is, rather, a transformation to fit a new social interpretation expressed in terms of space, light, weight, weightlessness, and material.

Holl's building is a fitting place to close because it is also a reminder that the formulation of an authentic architectural language is a long business of testing and reflection in which many sources within and beyond architecture are gradually absorbed into a system of expression. The surrounding culture is obsessed with transience and change, and sometimes resorts to the quick fix of instant history. But modern architecture at its most ambitious keeps coming back to the same old things, rethinking and transforming them in unexpected new ways. Since Louis Kahn is also being honored by the AIA in 1998 with the 25-Year Award for the Kimbell Art Museum (page 130), perhaps we should leave the final statement to him: "If I were to define architecture in a word I would say that architecture is a thoughtful making of spaces." ■

Chapel of St. Ignatius by Steven Holl Architects

# Winners

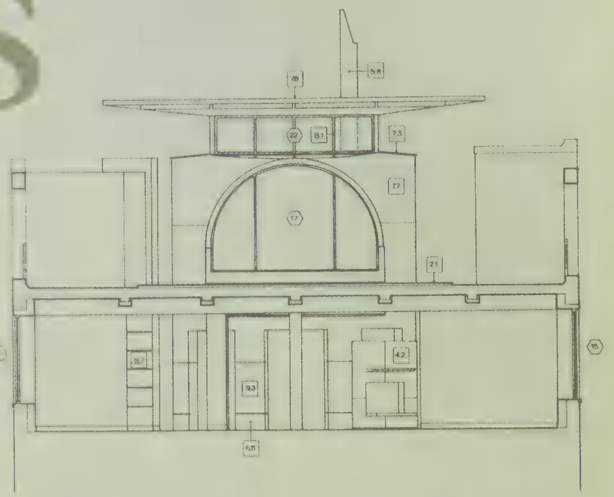
**Architecture** *(page 108)*
*Type/Variant House,* Vincent James Associates; James/Snow Architects. *Becton Dickinson and Co., Building 2,* Kallmann, McKinnell & Wood Architects. *Chapel of St. Ignatius at Seattle University,* Steven Holl Architects; Olson Sundberg Architects. *St. Andrew Presbyterian Church,* Turnbull Griffin Haesloop. *Ventilation Building No. 7,* TAMS Consultants; Stull & Lee, Inc.; Wallace, Floyd, Associates. *Atlantic Center for the Arts,* Thompson and Rose Architects. *Brandenburg's Ravenwood Studio,* Salmela Architect. *Orange Place Cooperative,* Studio E Architects. *Powell Library Renovation,* Moore Ruble Yudell Architects & Planners. *U.S. Court of Appeals Renovation,* Skidmore, Owings & Merrill, San Francisco.

**Interiors** *(page 118)*
*Manhattan Rooftop Residence,* Shelton, Mindel & Associates; Reed Morrison, Architect. *Neisser Residence,* Tigerman McCurry Architects. *101 CityFood Cafe,* Westfourth Architecture. *New Hearth Showroom,* Mark Simon of Centerbrook Architects and Planners. *The Salad Bowl,* Hugh A. Boyd, Architects. *New Amsterdam Theater,* Hardy Holzman Pfeiffer Associates. *Private Apartment,* Frank Lupo/Daniel Rowen, Architects. *Wilkhahn North America Showroom,* Skidmore, Owings & Merrill, Chicago. *The Helen & Harry Gray Court at the Wadsworth Atheneum,* Tai Soo Kim Partners. *Civic Opera House Renovation,* Skidmore, Owings & Merrill, Chicago. *MIT School of Architecture and Planning,* Leers Weinzapfel Associates.

**Urban Design** *(page 124)*
*Beursplein Rotterdam,* The Jerde Partnership International; De Architekten Cie; T+T Design. *Jamaica Market,* James McCullar & Associates. *Robert F. Wagner, Jr., Park,* Machado and Silvetti Associates; Olin Partnership; Lynden B. Miller Gaden Design. *City Campus of the Savannah College of Art and Design,* Lee Meyer & Co., Architects. *Ellen Wilson Neighborhood Redevelopment,* Weinstein Associates Achitects. *State Street Renovation,* Skidmore, Owings & Merrill, Chicago.

**Firm Award** *(page 128)*
Centerbrook Architects and Planners.

**25-Year Award** *(page 130)*
*Kimbell Art Museum,* Louis I. Kahn, FAIA.



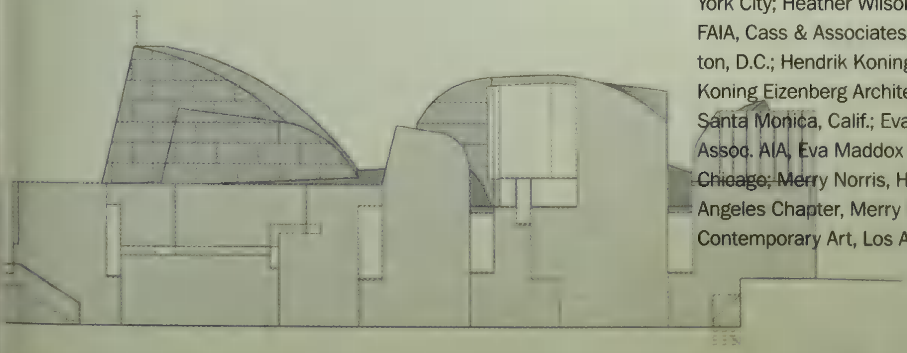
# Jurors

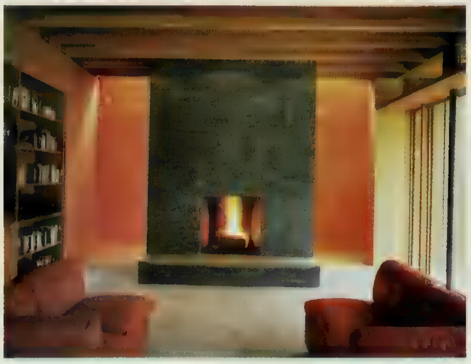
**Architecture/25-Year Award**
Mark Simon, FAIA (chair), Centerbrook Architects and Planners, Essex, Conn.; Walter F. Chatham, FAIA, Walter F. Chatham Architect, New York City; Bruce A. Eckfeldt, Assoc. AIA, BWBR Architects, St. Paul, Minn.; Michael L. Quinn, FAIA, Quinn/Evans Architects, Washington, D.C.; Adele Naude Santos, FAIA, Adele Naude Santos & Associates, Philadelphia; Peter L. Schaudt, FAAR ASLA, Peter Lindsay Schaudt Landscapes, Chicago; Scott A. Welch, University Park, Md.; Allison G. Williams, FAIA, Ai San Francisco, San Francisco; Robert L. Ziegelman, FAIA, Luckenbach/Ziegelman & Partners, Birmingham, Mich.

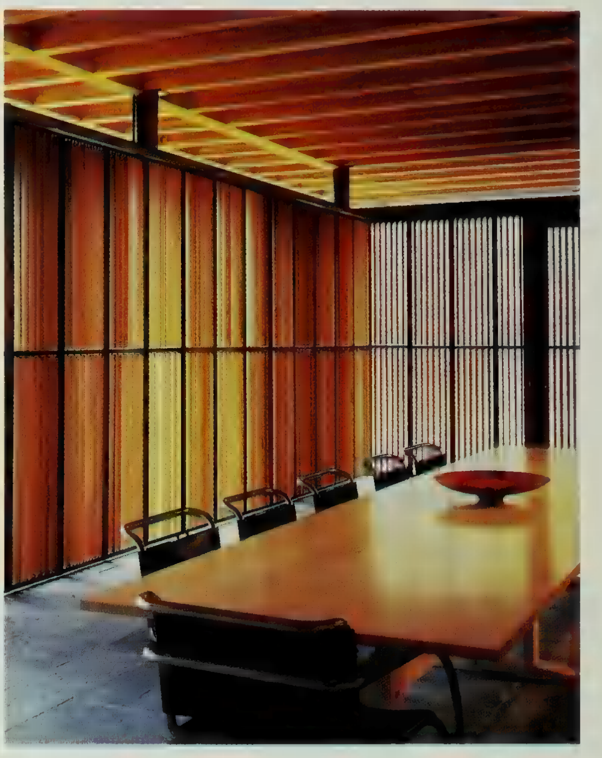
**Interiors**
Steven M. Goldberg, FAIA (chair), Mitchell/Giurgola Architects, New York City; Heather Wilson Cass, FAIA, Cass & Associates, Washington, D.C.; Hendrik Koning, FAIA, Koning Eizenberg Architecture, Santa Monica, Calif.; Eva Maddox, Assoc. AIA, Eva Maddox Associates, Chicago; Merry Norris, Hon. AIA Los Angeles Chapter, Merry Norris Contemporary Art, Los Angeles

**Urban Design**
William Rawn, FAIA (chair), William Rawn Associates, Boston; Rebecca G. Barnes, AIA, Frederic R. Harris, Inc., Boston; Steve Dragos, Somerset Alliance, Somerville, N.J.; Robert Geddes, FAIA, Princeton, N.J.; Michael Southworth, FAIA, University of California at Berkeley.

**Firm Award**
Cynthia Weese, FAIA (chair), Washington University School of Architecture, St. Louis, Mo.; Frederick Bland, FAIA, Beyer Blinder Belle, New York City; Michael Convertino, Assoc. AIA, Mallin Mendel & Associates Architects, Albany; John Morris Dixon, FAIA, Old Greenwich, Conn.; Daniel Gregory, *Sunset* Magazine, Menlo Park, Calif.; Charles W. "Duke" Oakley, FAIA, Pacific Palisades, Calif.; The Honorable Douglas Woodlock, Boston.

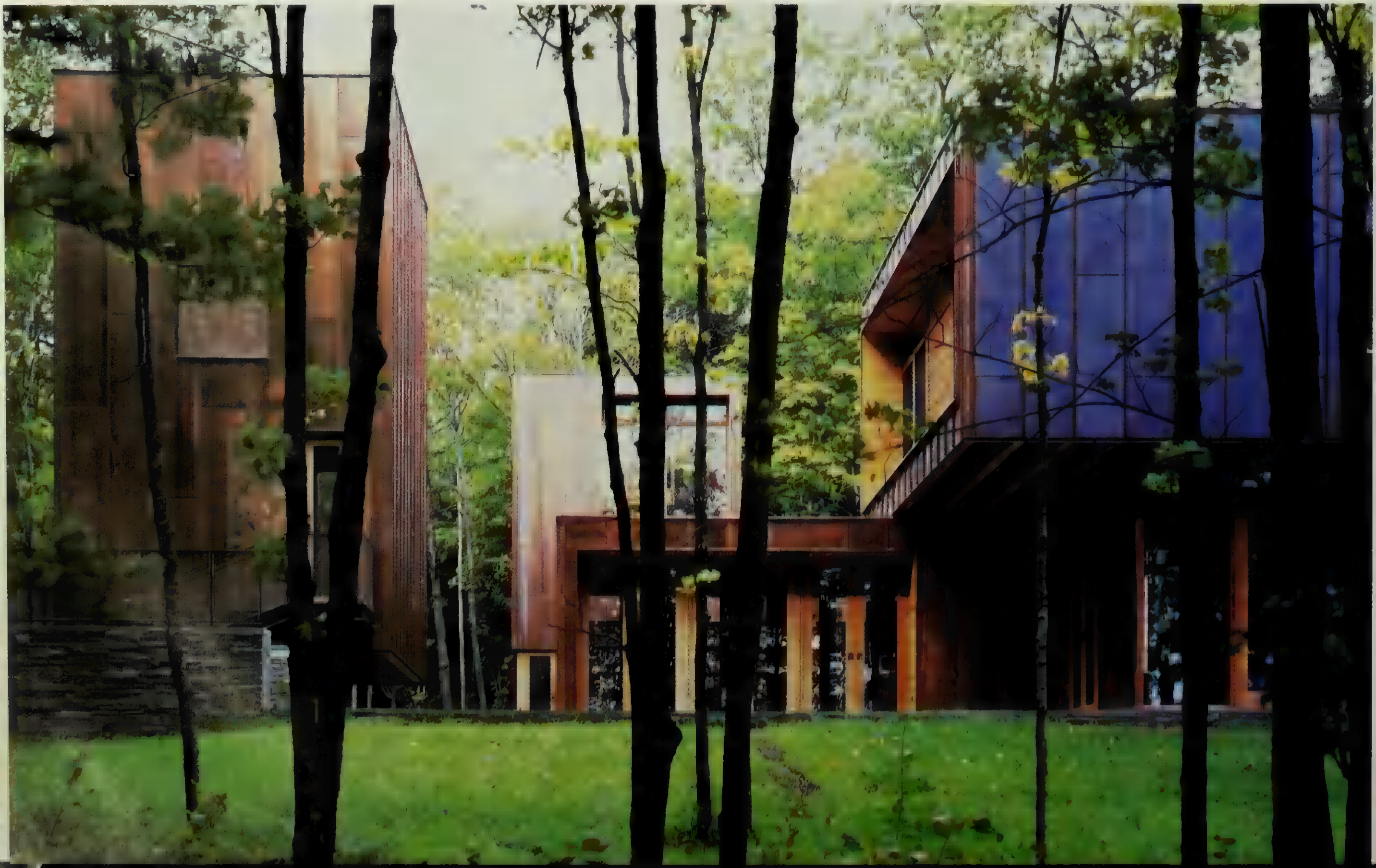






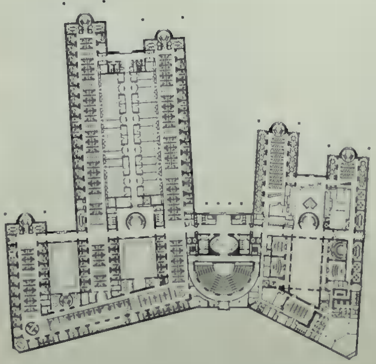
**Type/Variant House**
*Northern Wisconsin*
**Architect:** *Vincent James Associates (begun by James/Snow Architects)*

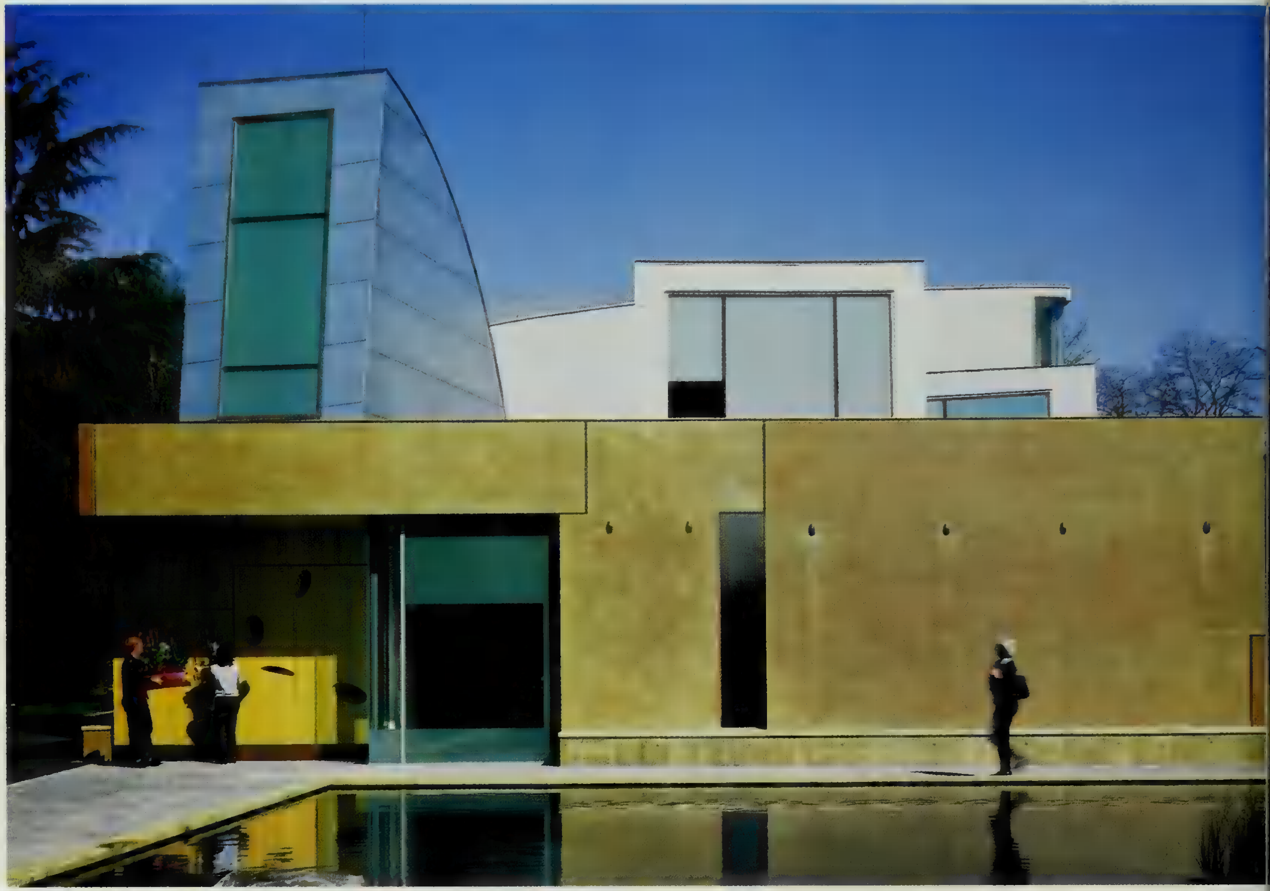
*Built for a family of seven, this 8,000-square-foot house plays on the idea of "type/variant" used by collectors to note similarities and differences among pieces. The wood-frame, copper-clad volumes are of one type of form, but they vary in orientation and proportions. Materials that weather naturally knit the house to its woodlands setting.*

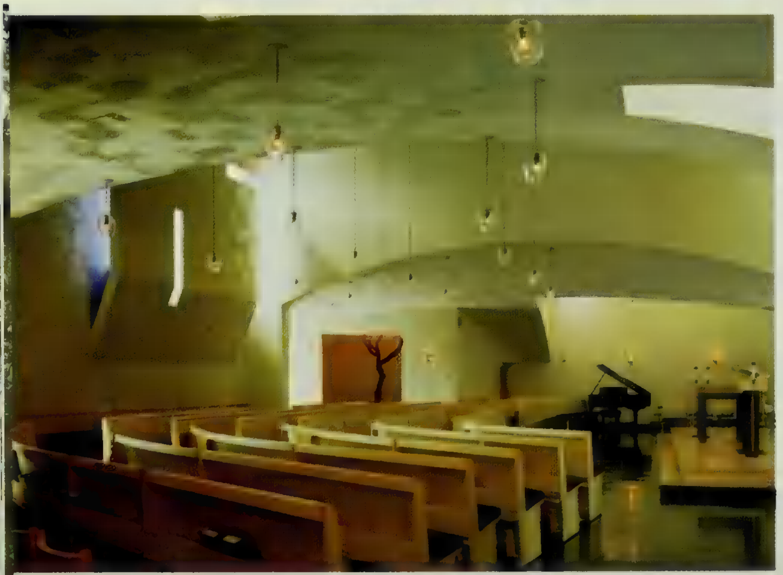


**Becton Dickinson and Co., Building 2**
*Franklin Lakes, New Jersey*
**Owner:** *Becton Dickinson and Co.*
**Architect:** *Kallmann, McKinnell & Wood Architects*

*Offices wrap around laboratories in this 450,000-square-foot facility, whose plan makes it read more as a series of pavilions than as one large building. Interior atria topped by skylights function as covered courtyards. To make the space more flexible, a modular system for office partitions and services was incorporated into the design.*

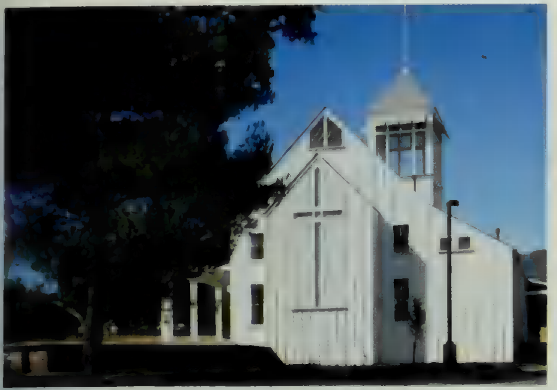






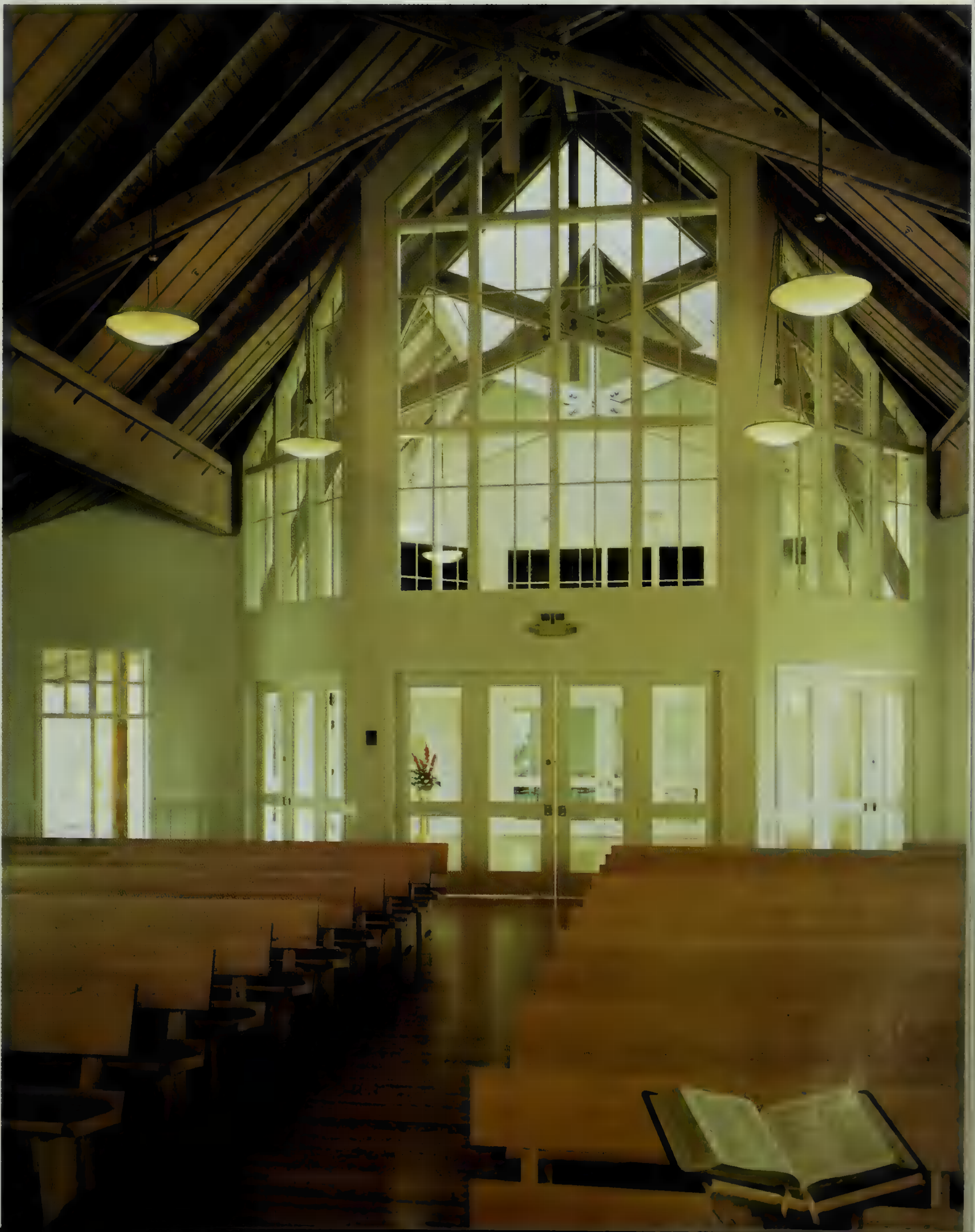
**Chapel of St. Ignatius**
*Seattle, Washington*
**Owner:** *Seattle University*
**Architect:** *Steven Holl Architects; Olson Sundberg Architects*

*Light as a metaphor and as an ever-changing, often surprising presence is at the heart of this 6,100-square-foot chapel. Roof monitors bring light in from above, then reflect it off interior surfaces, which are painted in a range of colors. Structurally, the chapel is remarkably simple, relying mostly on steel and tilt-up concrete panels. [RECORD, July 1997, page 40]*



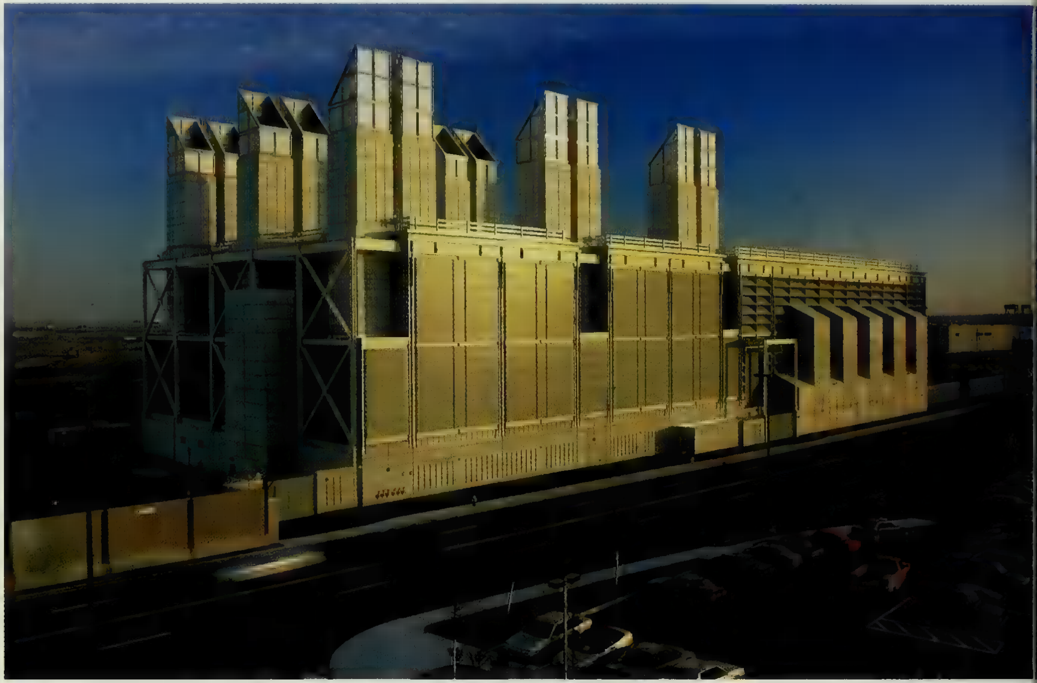
**St. Andrew Presbyterian Church**
*Sonoma, California*
**Owner:** *St. Andrew Presbyterian Church*
**Architect:** *Turnbull Griffin Haesloop*

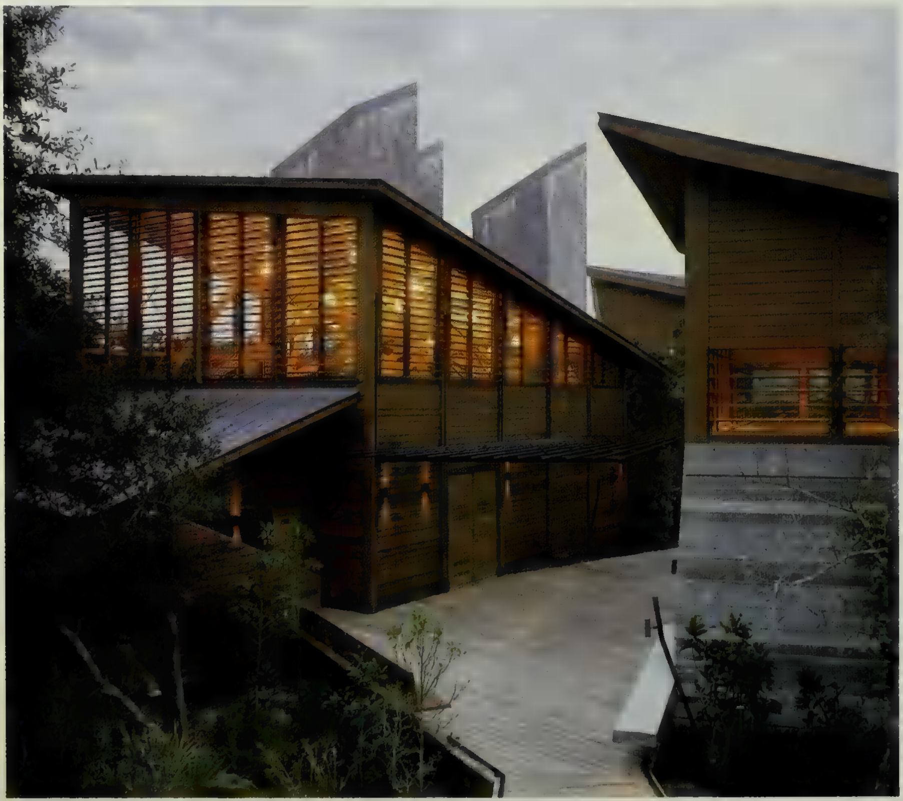
*One of the last projects designed by the late William Turnbull, FAIA, the 12,000-square-foot St. Andrew church evokes rural barns in its forms and simple detailing while featuring an inventive floor plan that brings together a sanctuary, a fellowship hall, offices, and classrooms. A high cupola anchors the composition, bringing light into an octagonal narthex with the sanctuary and fellowship hall on either side. The wood-frame and plywood building replaces an old carriage house that had been converted to a church but burned down in 1989.*



**Ventilation Building No. 7**
*Logan Airport, Boston*
**Owner:** *Massachusetts Highway Department*
**Architects:** *TAMS Consultants; Stull & Lee, Inc.; Wallace, Floyd, Associates*

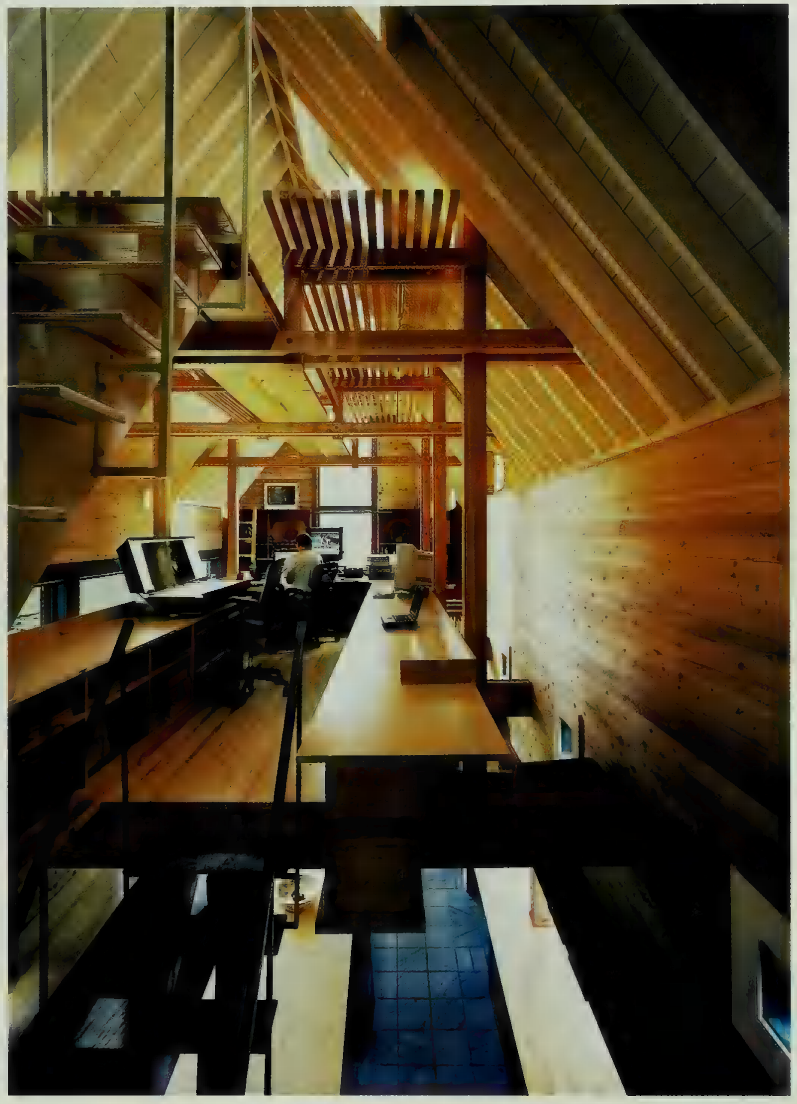
*Built for the new Ted Williams Tunnel linking Logan Airport to Boston, this ventilation building has two primary parts: an intake section sheathed with aluminum louvers, and an exhaust section with 14 towers of concrete and stainless steel. The building houses room-size exhaust and supply fans that direct tunnel fumes above the roof and dispense fresh air to the tunnel. [RECORD, February 1998, page 100]*





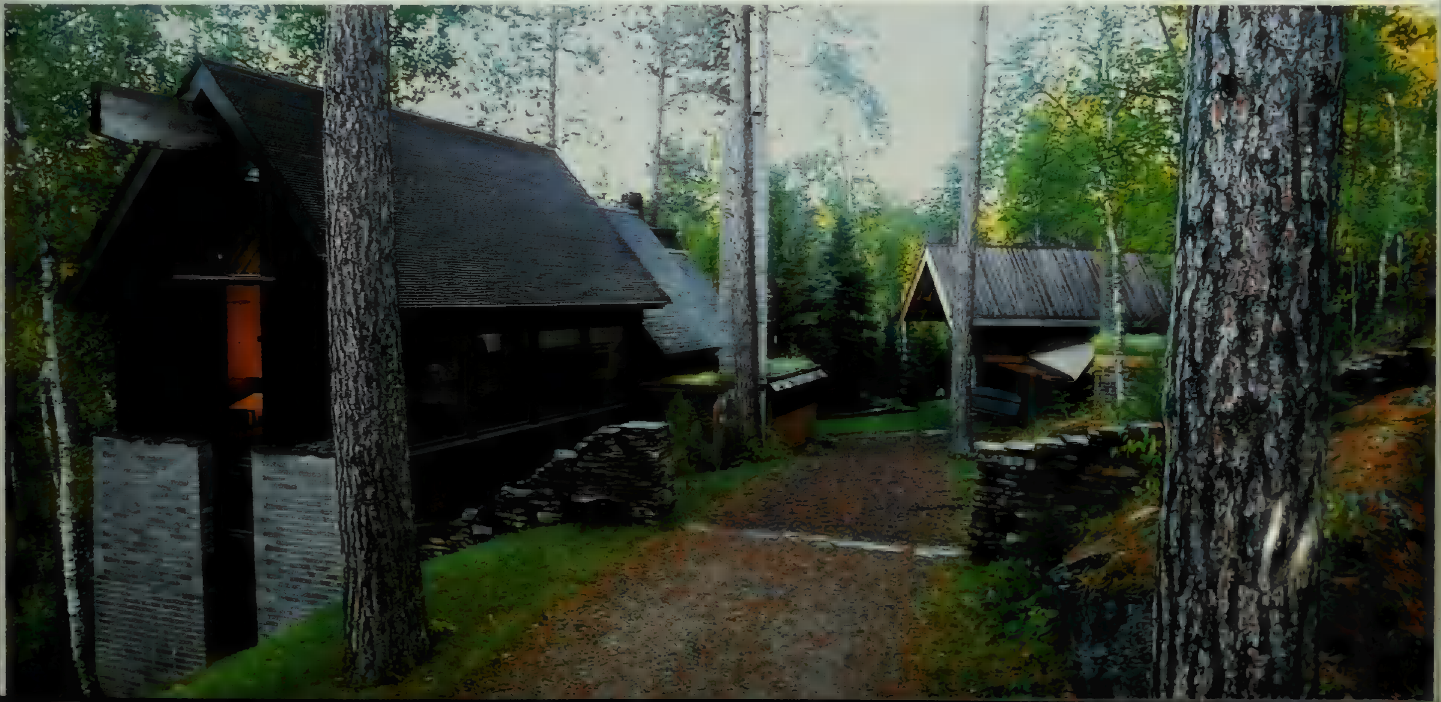
**Atlantic Center for the Arts**
*New Smyrna Beach, Florida*
**Owner:** *Atlantic Center for the Arts*
**Architect:** *Thompson and Rose Architects*

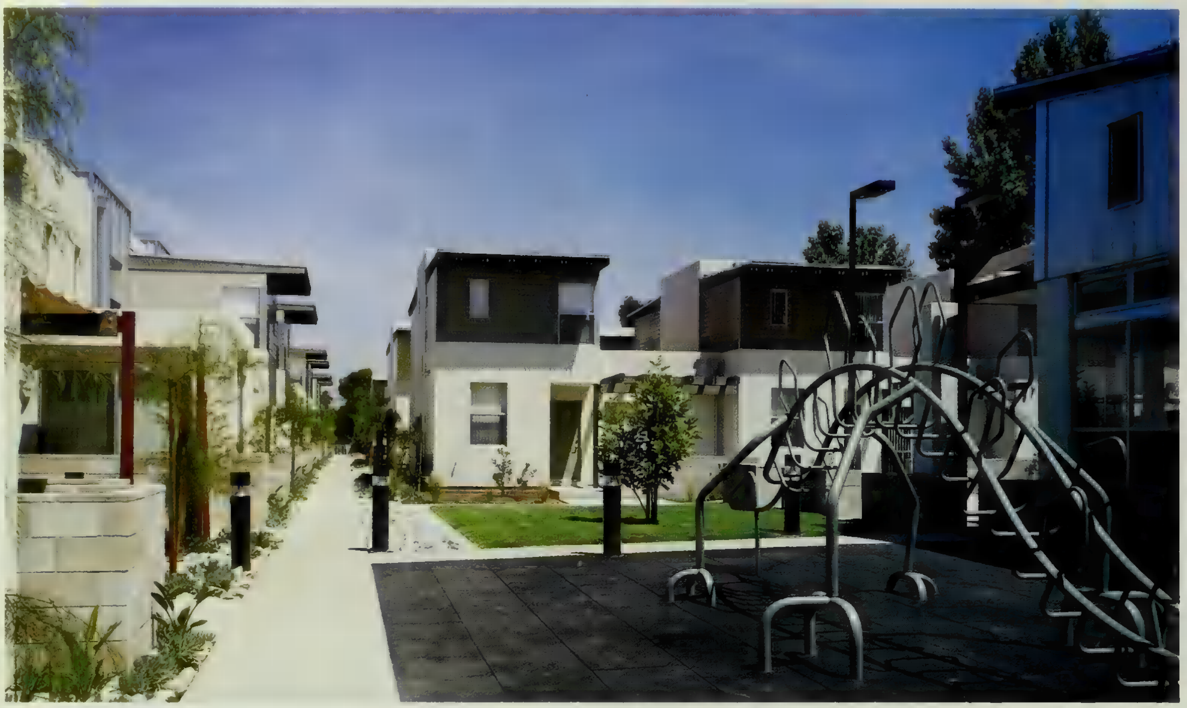
*Sensitively inserted onto a site thick with palmetto shrubs and twisted scrub oak, this artists' retreat is a series of pavilions dedicated to individual art forms: dance, sculpture, painting, music. A winding boardwalk connects the various buildings and serves as auxiliary open space. Building materials include mahogany panels, lead-coated copper roofs, concrete walls, fixed louvers, and sliding-glass doors. [RECORD, June 1997, page 98]*



**Brandenburg's Ravenwood Studio**
*Ely, Minnesota*
**Owner:** *Jim and Judy Brandenburg*
**Architect:** *Salmela Architect*

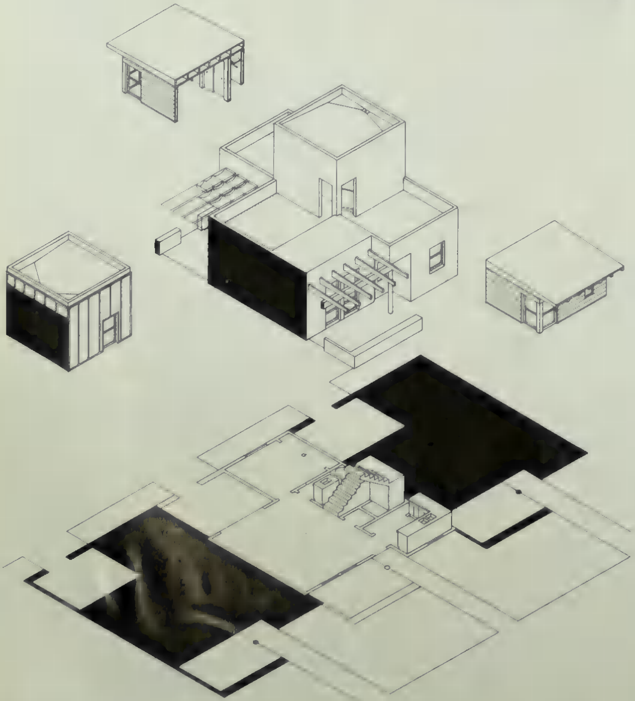
*Set on the edge of a 3 million-acre wilderness park, this residence and studio for a* National Geographic *photographer and his wife unfolds as a series of gabled wood structures in the forest. The architectural forms are reminiscent of Scandinavian immigrant farm buildings, but they are detailed with a contemporary sensibility.*

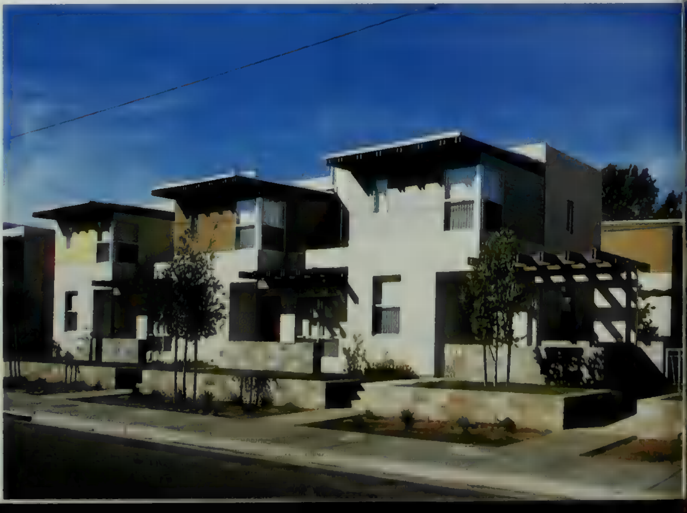


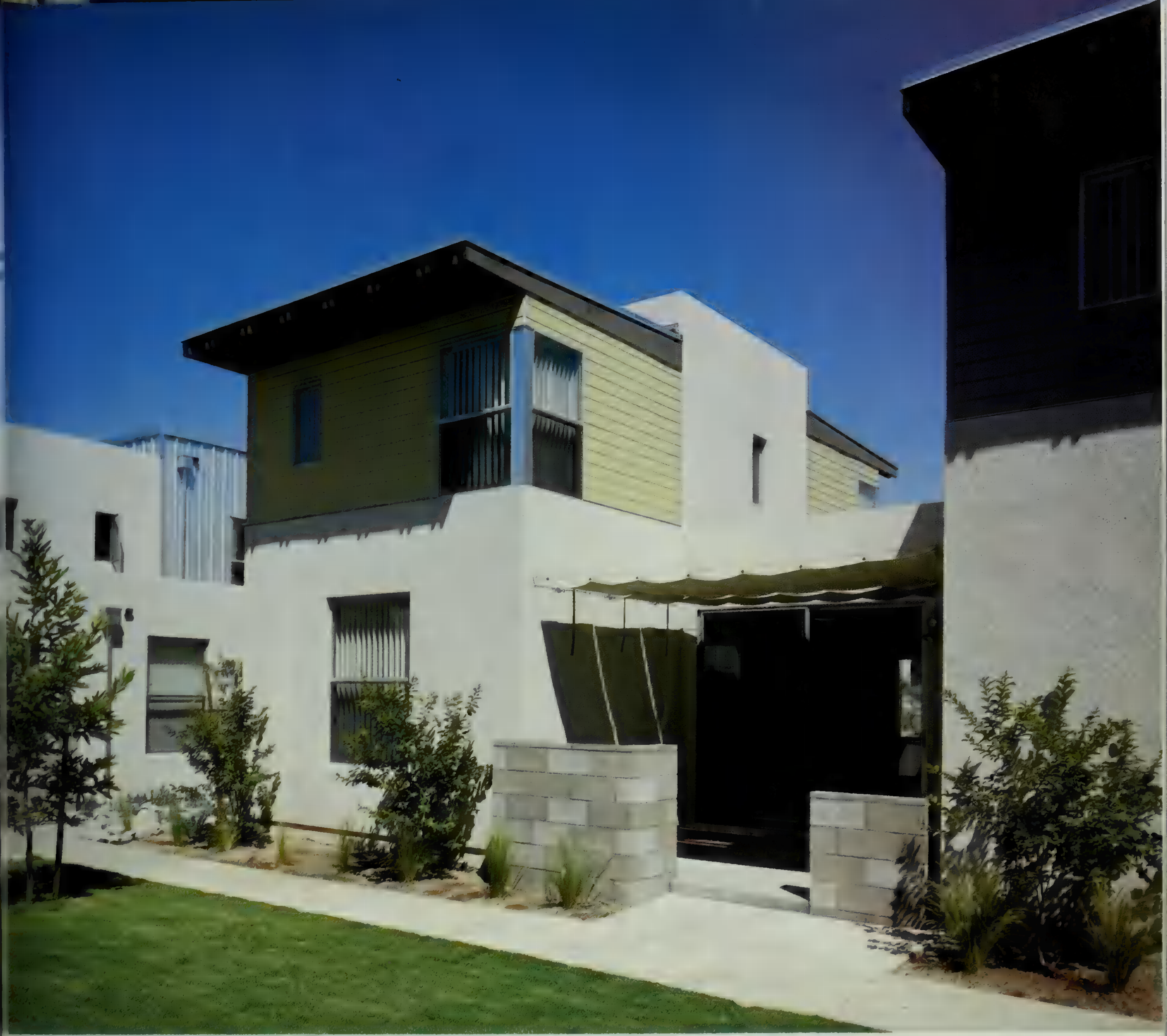


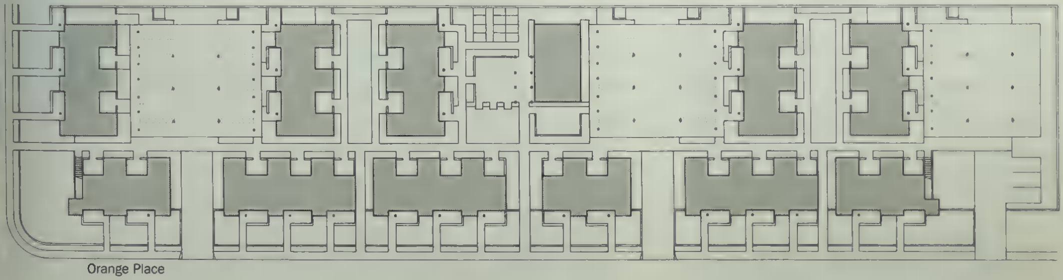
**Orange Place Cooperative**
*Escondido, California*
**Owner:** *Community Housing of North County*
**Architect:** *Studio E Architects*

*Modeled after Southern California bungalow courts, this 32-unit affordable housing cooperative puts parking behind the buildings to leave the street elevations free for small porches, lawns, and retaining walls perfect for sitting. Most apartments are two-story units with three or four bedrooms, but there are a few flats and small units. All have their own outdoor space and access to shared courts and a community building. Tax credits, local grants, and private money covered the project's $2.2 million construction budget.*

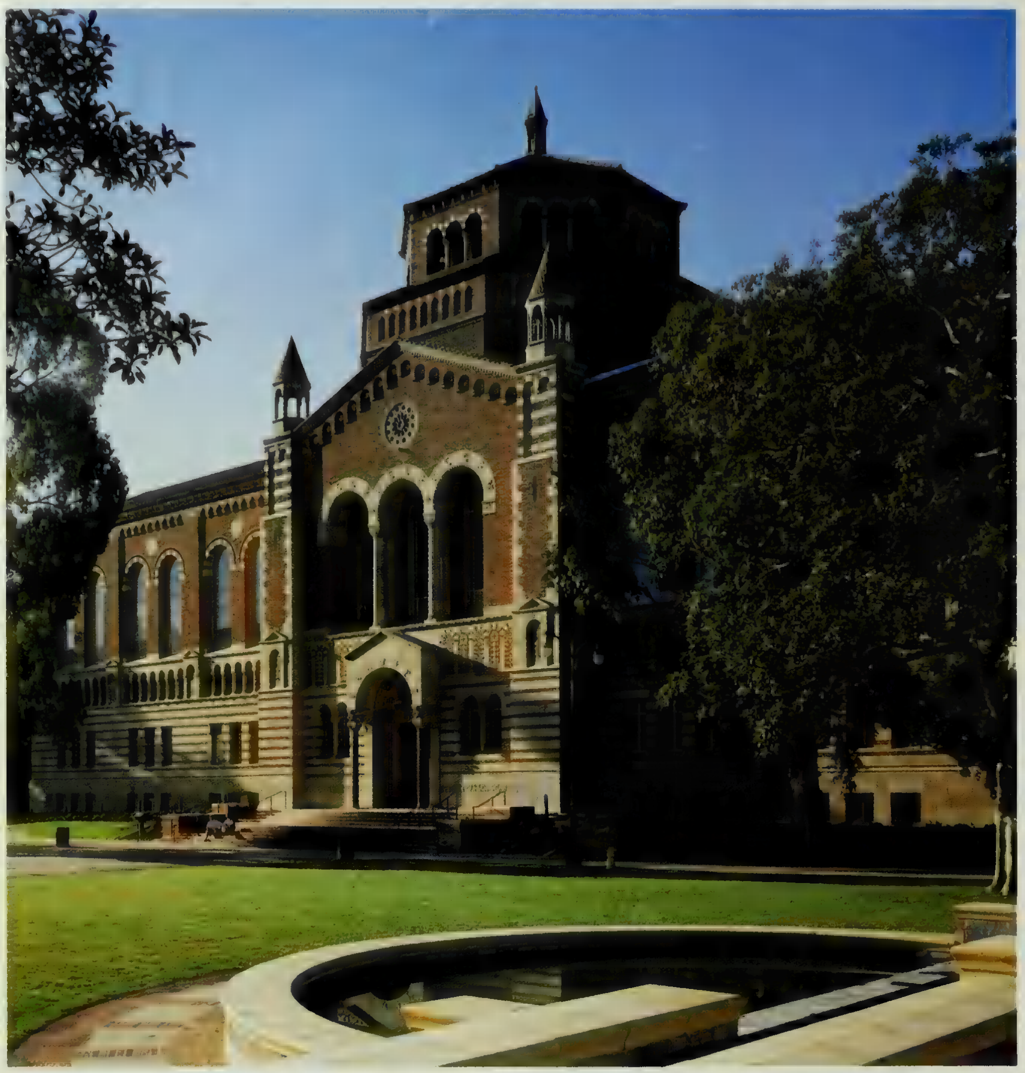






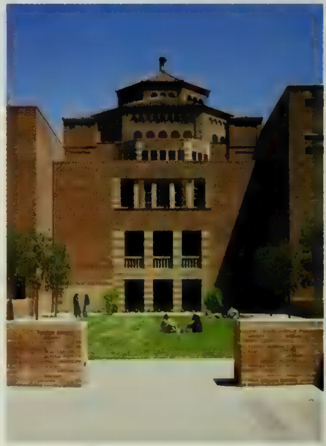


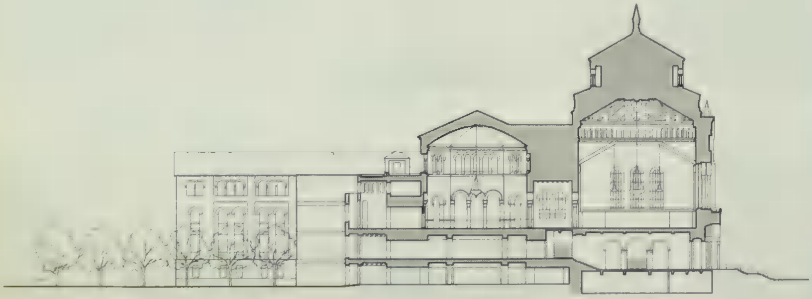
An interior path and a series of common outdoor spaces create a sense of community (above and opposite top). The front facade (opposite bottom) engages the street.

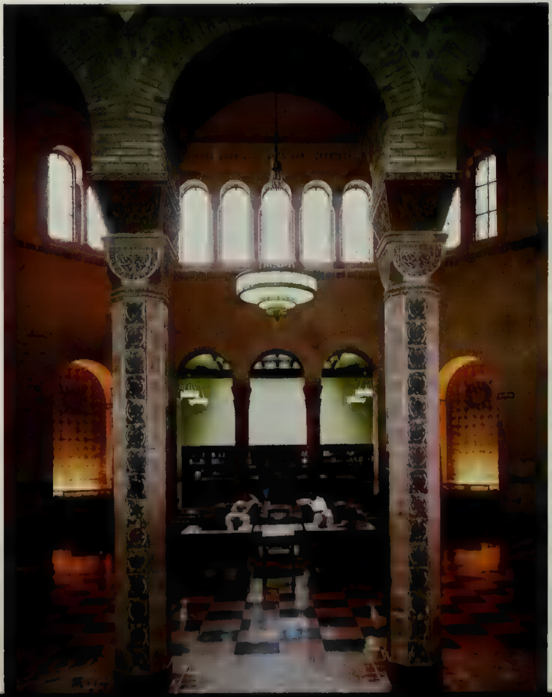


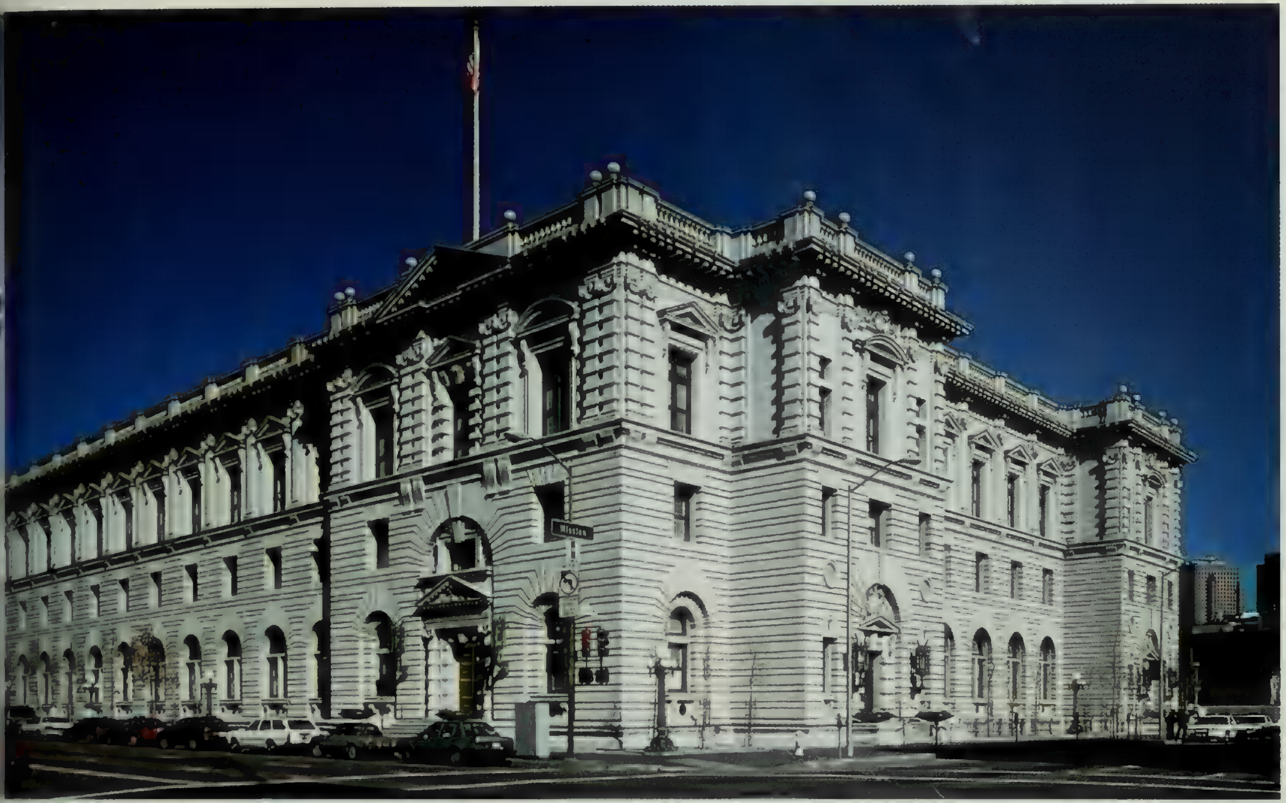
**Powell Library Renovation**
*University of California, Los Angeles*
**Owner:** *University of California*
**Architect:** *Moore Ruble Yudell Architects & Planners*

*Hired to design seismic, life-safety, and accessibility improvements for this 1929 neo-Romanesque building, the architects accomplished these goals while adding a new south loggia and garden. Oriented to new campus growth, the modifications create reading and study areas of different character. In making all parts of the library accessible, the architects removed large handicapped ramps and restored the building's original identity by eliminating awkward changes done over the years.*



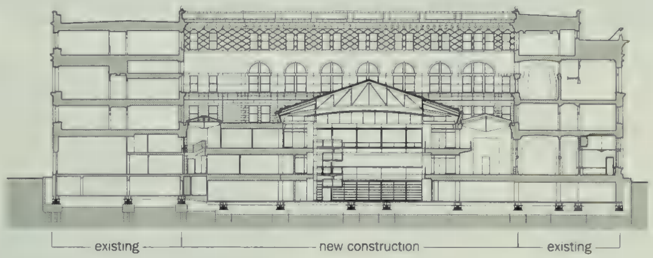


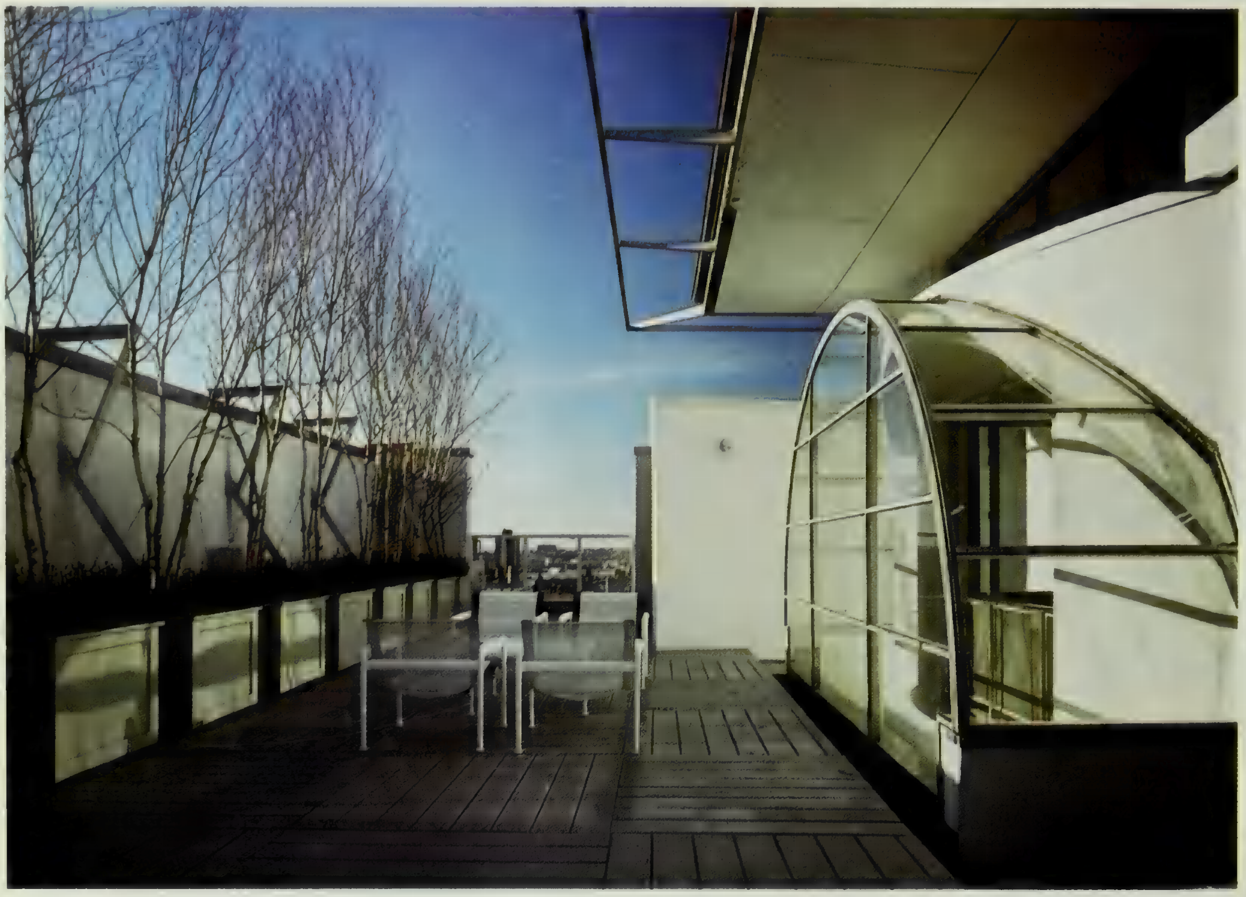




**U.S. Court of Appeals Renovation**
*San Francisco, California*
**Client:** *General Services Administration*
**Architect:** *Skidmore, Owings & Merrill, San Francisco*

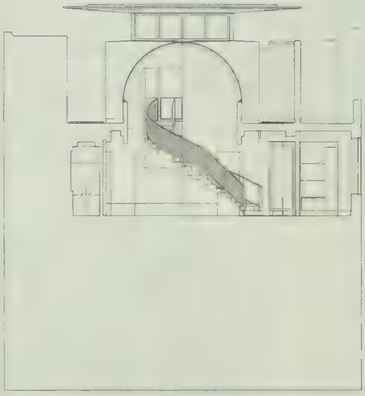
*Damaged by the 1989 Loma Prieta earthquake, the 1905 courthouse received a major renovation that included restoring and modernizing its opulent hearing rooms, and creating a new skylit atrium in what had been a dark interior area. The key to the seismic retrofit is a friction pendulum system of base isolation, among the first and largest uses of this new technology.*

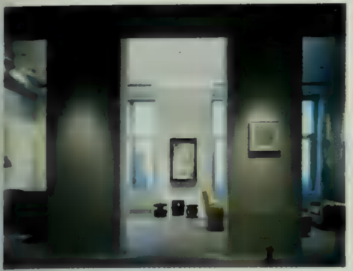


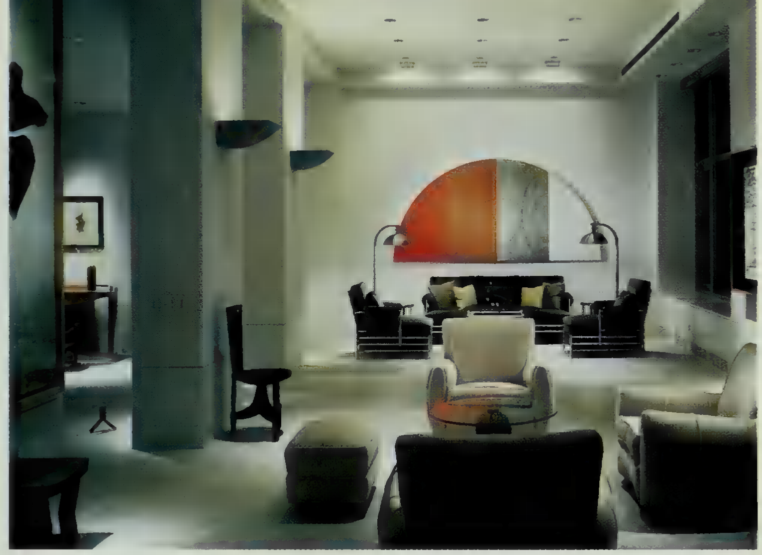


**Manhattan Rooftop Residence**
*New York City*
**Architect:** *Shelton, Mindel & Associates*
**Associate Architect:** *Reed Morrison, Architect*

*Inspired by the water tanks that dot the city's roofscapes, the architects designed a modern addition that rises from the 12th story of a former manufacturing building. Geometric forms such as a rotunda, a curved glass vault, and a double-helix stair establish the character of the apartment, while generous glazing offers views in four directions.*

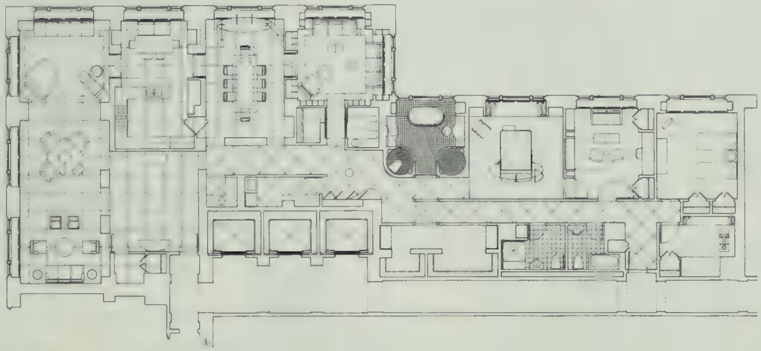


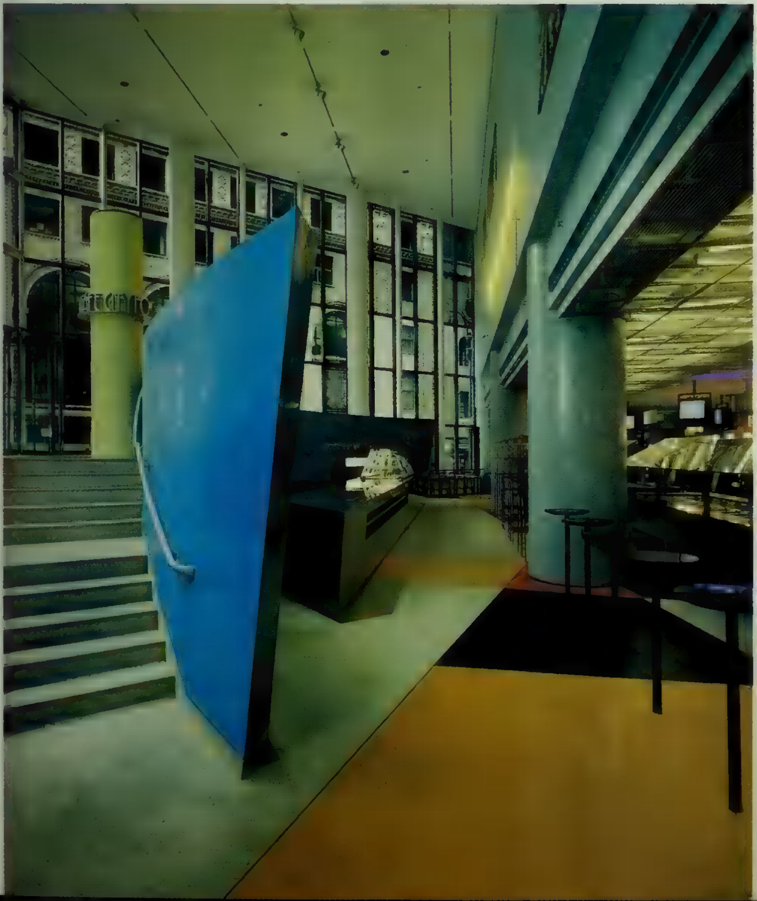




**Neisser Residence**
*Chicago*
**Owner:** *Judith Neisser*
**Architect:** *Tigerman McCurry Architects*

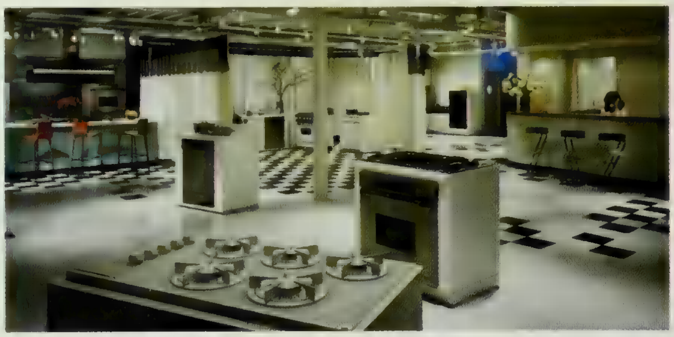
*The architects reduced the surfaces and detailing of this 4,400-square-foot apartment to their essence, creating an "absent presence." The plan unfolds as a series of chambers* en suite, *a strategy that underscores the restrained elegance of the apartment. Accommodating an art collection, guest rooms for two adult children, and space for entertaining was also part of the design challenge.*

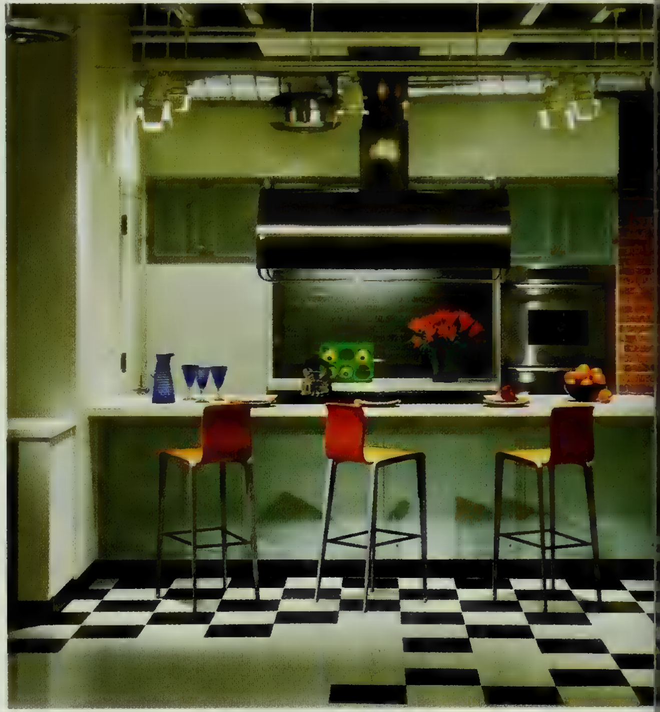




**101 Cityfood Cafe**
*New York City*
**Owner:** *Cafe Sonata, Inc.*
**Architect:** *Westfourth Architecture*

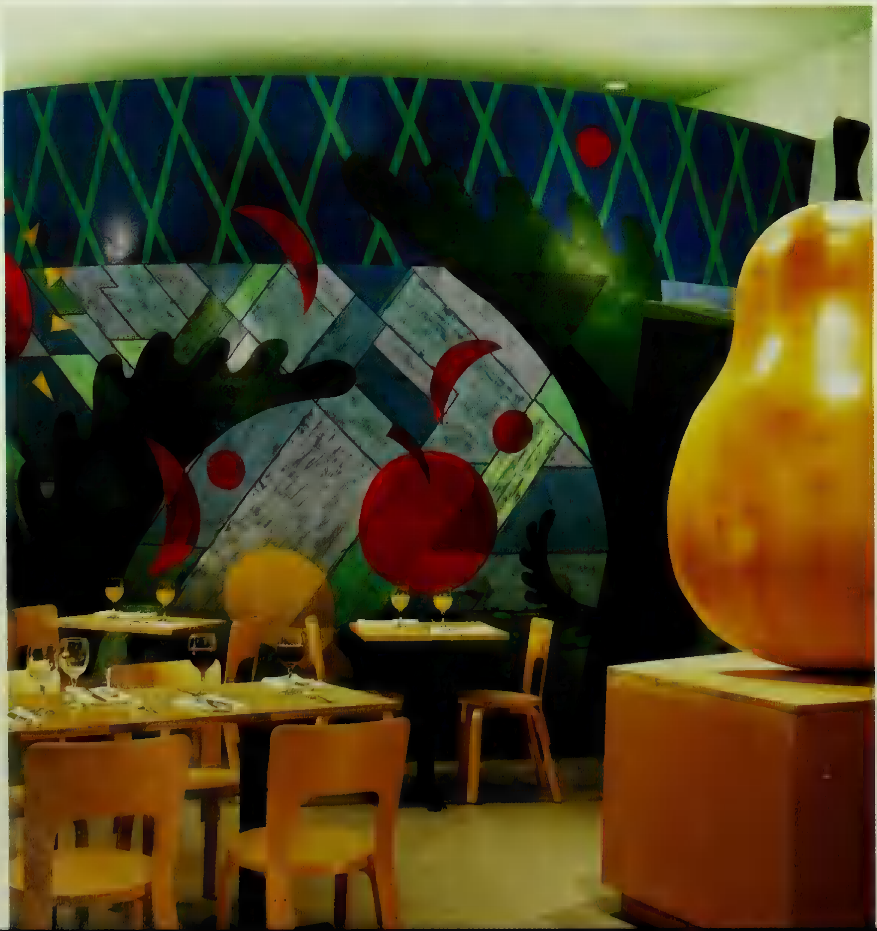
*A difficult 7,000-square-foot triangular space on the ground floor of an office tower was turned into an energetic food court and take-out café. To break down the space and identify each type of food served, the architects designed five separate counters, including a sushi bar made of cherry wood and others made of millwork wrapped in stainless steel. Bright colors and a sense of layering enliven the space.*

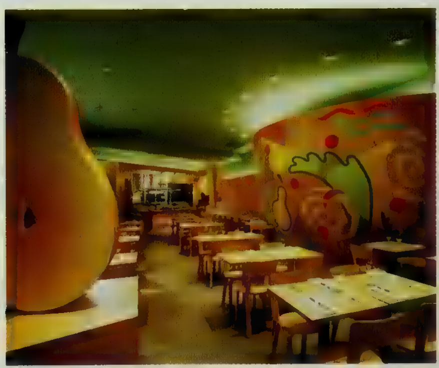




**New Hearth Showroom**
*New York City*
**Owner:** *D'Elia Associates*
**Architect:** *Mark Simon of Centerbrook*

*For a showroom where the products change periodically, Centerbrook designed a theatrical space with the flexibility of a stage set. Cross-hatched floor tracks allow the kitchen appliances and other items for sale to be moved around, while overhead track lighting provides enough illumination to turn the showroom into a small studio for demonstrations and videotapings.*





**The Salad Bowl**
*New York City*
**Architect:** *Hugh A. Boyd, Architects*

*Set within a dark, 24-by-100-foot envelope, this take-out and self-service café uses bold graphics, a few colorfully decorated elements, and good lighting to create an appetizing setting. Display counters and the open kitchen are located up front to provide maximum product exposure, and a perforated, backlit, serpentine piece of fabric above the open kitchen catches the eye. All this for $83 a square foot.*

**New Amsterdam Theater**
*New York City*
**Owner:** *Walt Disney Imagineering*
**Architect:** *Hardy Holzman Pfeiffer Associates*

*This "interpretive" restoration of one of Times Square's great old theaters involved preserving and re-creating elements from different periods in the building's history, as well as unobtrusively inserting new lobby spaces, mechanical systems, and elevators. [RECORD, June 1997, page 112]*

**Wilkhahn North America Showroom**
*New York City*
**Owner:** *Wilkhahn, Inc.*
**Architect:** *Skidmore, Owings & Merrill, Chicago*

*For a German furniture company, SOM designed spaces on two floors connected by a shot-blasted steel staircase that seems to hover between floors. An inclined plane of stainless-steel mesh bisects the lower floor, separating new items from those under development. Offices and more displays are upstairs.*

**Private Apartment**
*New York City*
**Architect:** *Frank Lupo/Daniel Rowen, Architects*

*The architects took two apartments and turned them into a single 2,500-square-foot pied-à-terre, in the process creating a minimalist environment in which the play of light against the walls, floors, and ceilings provides most of the visual stimulation. By eliminating almost all furniture and forgoing even the client's art collection, the design heightens a sense of separation from a hectic world.*

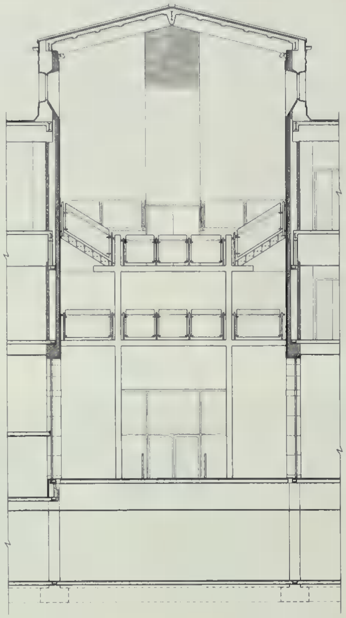
**The Helen & Harry Gray Court at the Wadsworth Atheneum**

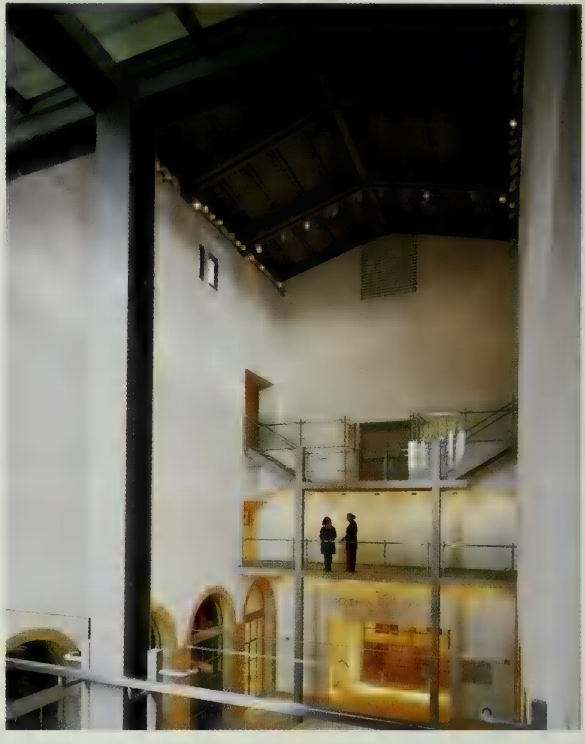
*Hartford, Connecticut*

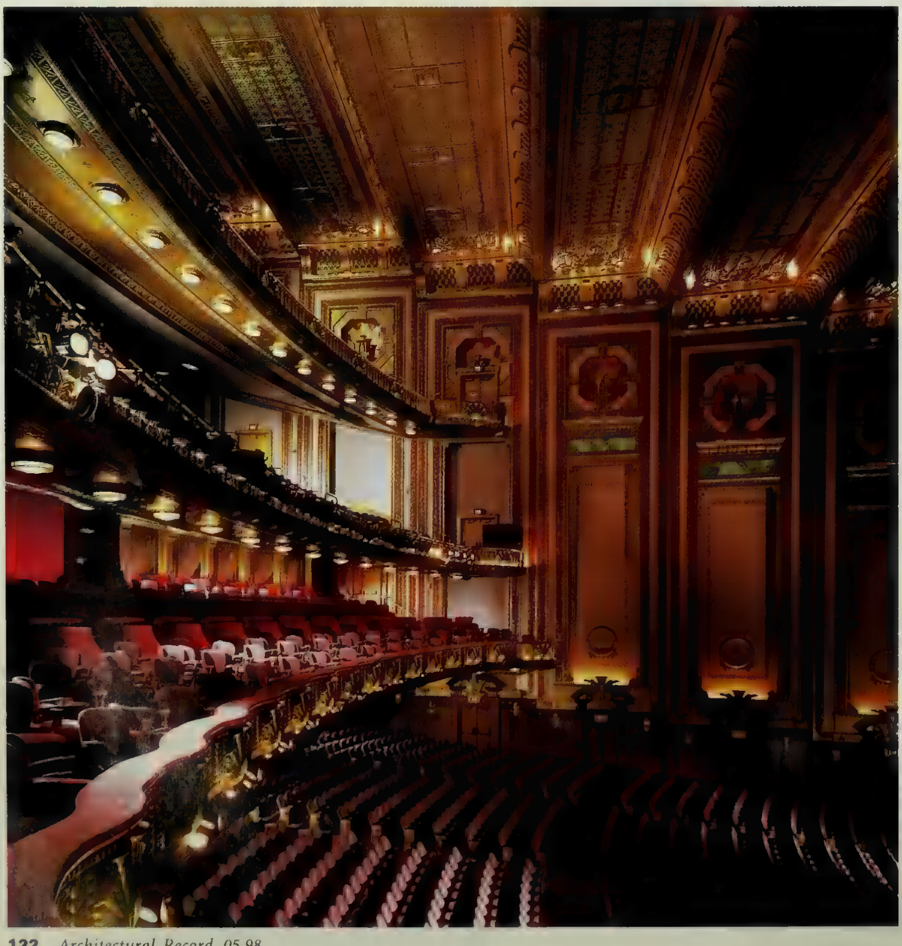
**Owner:** *Wadsworth Atheneum*

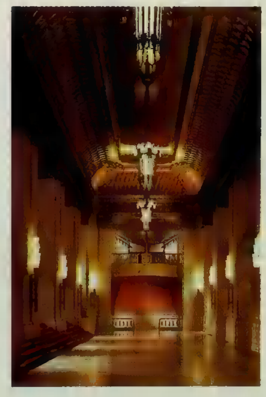
**Architect:** *Tai Soo Kim Partners*

*The architects transformed the main lobby of this museum by removing part of the third floor of its 1842 neo-Gothic building and creating a soaring 50-foot-high entry space. The court is animated with light from glass-and-steel windows set in limestone arches and translucent-glass bridges connecting galleries on the second and third floors.*









**Civic Opera House Renovation**

*Chicago*

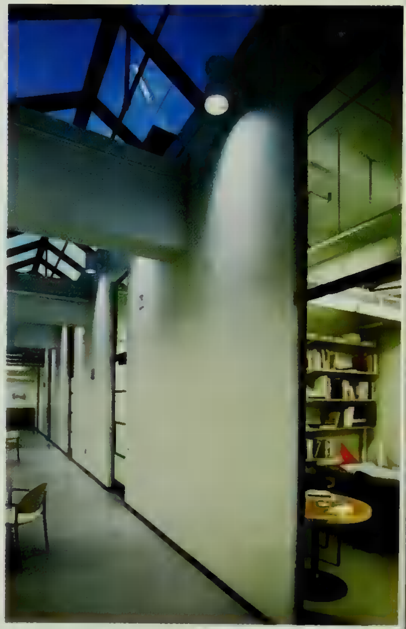
**Owner:** *Lyric Opera of Chicago*

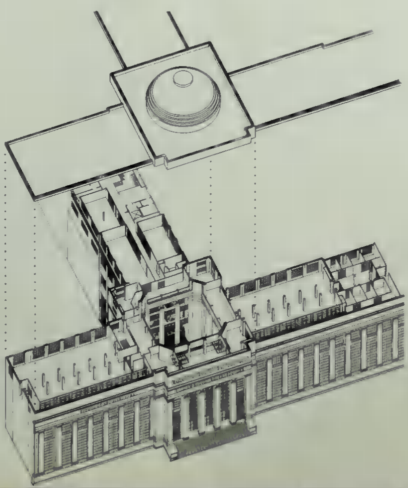
**Architect:** *Skidmore, Owings & Merrill, Chicago*

*Restoring this 1928 extravaganza involved design solutions for four different zones. The back-of-the-house was demolished and replaced with new scenery-handling and rehearsal spaces; the stage was equipped with new lighting and electrical systems; new seats were installed; and the exterior was refurbished with new lighting.*

**MIT School of Architecture and Planning**
*Cambridge, Massachusetts*
**Owner:** *MIT*
**Architect:** *Leers Weinzapfel Associates*

*The architects transformed what had been virtually abandoned space in the attic of MIT's "main group" of buildings into studio and review spaces, academic offices, and galleries. The project involved moving corridors, reconfiguring space around the dome, creating windowed studios, and wiring studios for computers.*





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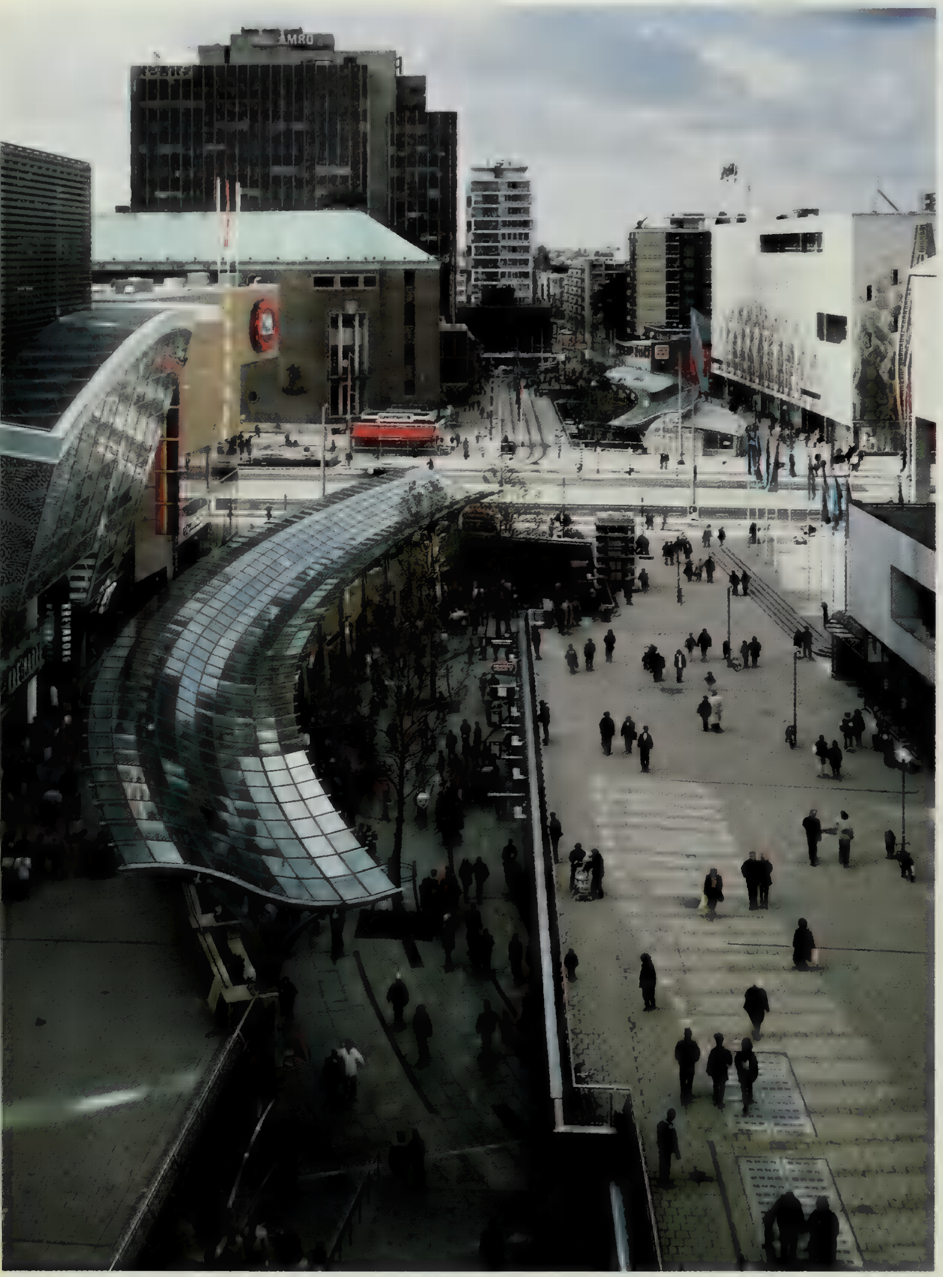
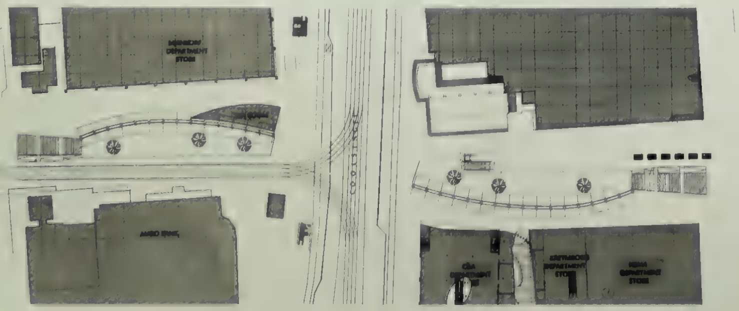


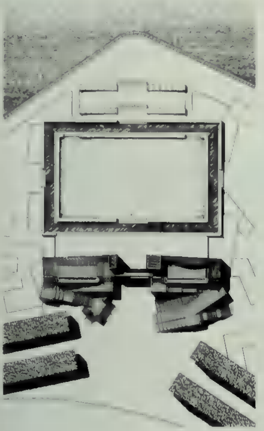
**Beursplein, Rotterdam**
*Rotterdam, The Netherlands*
**Client:** *Multi Vastgoed b.v.*
**Architect:** *The Jerde Partnership International; De Architekten Cie.; T+T Design*

*This mixed-use project creates a more unified downtown by connecting two market districts that were divided by a major traffic artery, Coolsingel Boulevard. Using energetic architecture, new retail, and entertainment features, the development takes pedestrians along a lively route that snakes underneath Coolsingel. The project includes Beursplein Promenade, a 1,000-foot-long shopping street that is covered by curving glass canopies and connects two outdoor plazas on either side of Coolsingel; Beurspassage, a three-level shopping gallery; four new department stores; a 30-floor apartment building; a parking garage; and the renovation and expansion of the busiest metro station in Rotterdam. Completed in August 1996, the project has been successful both financially and urbanistically, helping to revitalize a downtown that*



**Jamaica Market**
*Queens, New York*
**Owner:** *Greater Jamaica Development Corporation*
**Architect:** *James McCullar & Associates*

*A combination of new construction and adaptive reuse was employed to create a colorful marketplace that is revitalizing a blighted city block. The market includes a retail center for fresh and prepared foods, dining areas for a growing population of office workers, and community meeting rooms and offices. Developed by a local nonprofit corporation, the project has a distinct Caribbean-American flavor and now serves as an unofficial town center where festivals, seasonal events, and street fairs take place.*

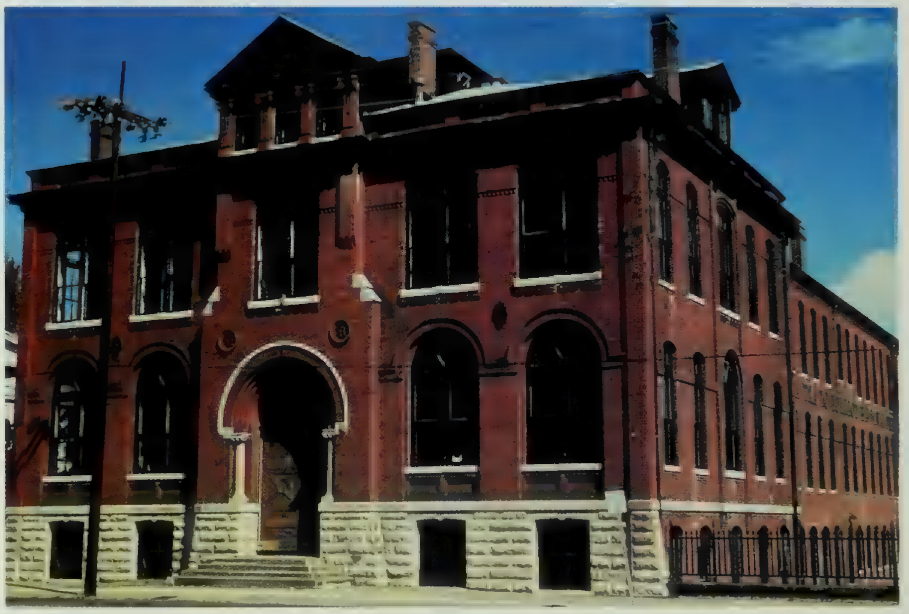


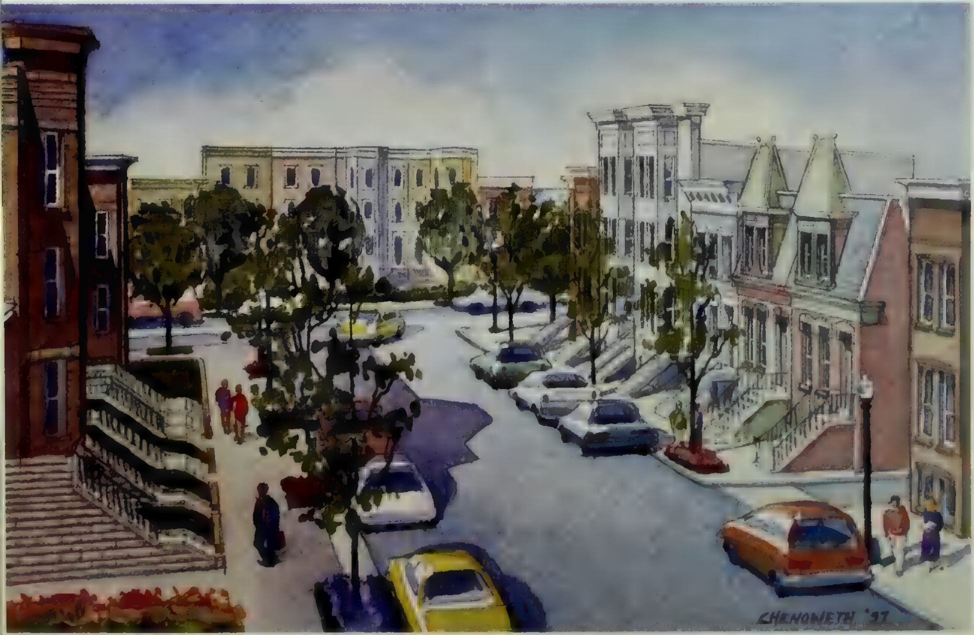
**Robert F. Wagner, Jr., Park**
*Battery Park City, New York*
**Client:** *Battery Park City Authority*
**Designers:** *Machado and Silvetti Associates (architecture); Olin Partnership (landscape); Lynden B. Miller (garden)*

*Set at the southern tip of Manhattan with the Hudson River in front and the island's famous skyline behind, this 3.5-acre park straddles the city edge where towers meet water. Formal garden elements (such as a stone-edged lawn and maple allées) complement a pair of brick-clad pavilions. [RECORD, February 1997, page 64]*

**Project:** *City Campus of the Savannah College of Art and Design, Savannah, Georgia*
**Owner:** *Savannah College of Art and Design*
**Architect:** *Lee Meyer & Co., Architects*

*Encompassing nearly 50 buildings throughout the downtown historic district, the Savannah College of Art and Design has made the city its campus. Over a 20-year period, the school has rescued abandoned buildings and renovated historic structures, injecting much-needed economic activity into a downtown that had experienced difficult times. The multidisciplinary emphasis of the college reinforces a diverse urban fabric and is a natural complement to a city that has a rich history dating back several centuries.*



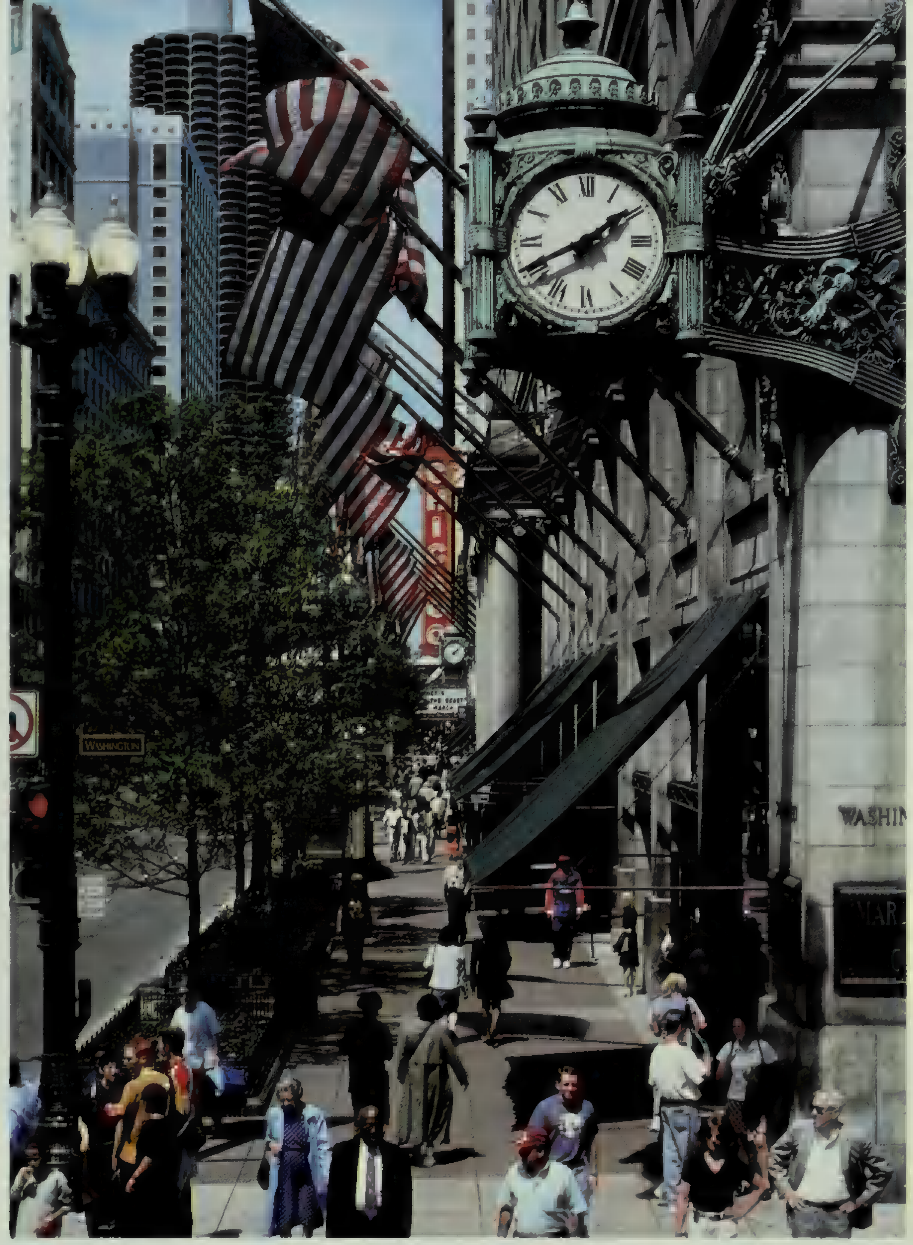


**Ellen Wilson Neighborhood Redevelopment**
*Washington, D.C.*
**Owners:** *Ellen Wilson Redevelopment Corporation; Telesis Corporation; McHenry Tag, Inc.; District of Columbia Housing Authority*
**Architect:** *Weinstein Associates*

*Now under construction, this project replaces abandoned public housing on a 5.3-acre site adjacent to the Capitol Hill Historic District. Funded by HUD's Hope VI program, the plan reintegrates the site into the surrounding community, both physically and socially. The 154 living units are modeled after nearby Victorian streetscapes.*

**State Street Renovation**
*Chicago*
**Client:** *City of Chicago, Department of Transportation*
**Architect:** *Skidmore, Owings & Merrill, Chicago*

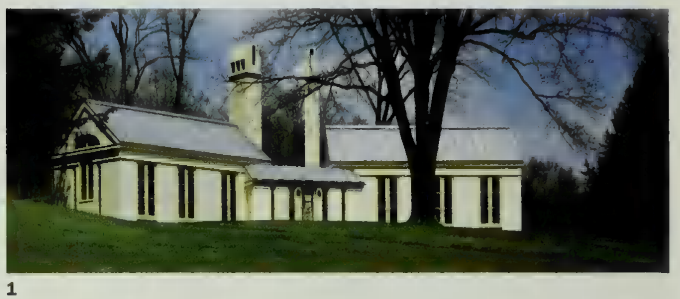
*The primary challenge of this project was to rectify the unsuccessful 1979 conversion of State Street into a pedestrian mall. SOM's plan weaves State Street back into a resurgent downtown, returning it to its place as an economically and architecturally important part of Chicago's downtown Loop—home to Louis Sullivan's Carson Pirie Scott store and other modern landmarks. The $23 million renovation included bringing car traffic back to the street, returning sidewalks to their original width, and building new sidewalks with light-colored concrete to give the street a brighter look. In addition, sidewalk planters were installed near the curb line to create a "green street." New streetlights combine recastings of the original Graham, Anderson, Probst & White fixtures that graced State Street from 1926 to 1958 with new globe lighting and armatures that bring light closer to pedestrians. The project also included new subway entrances that fit in with the historic nature of the street.*



# CENTERBROOK NAMED FIRM OF THE YEAR FOR ECLECTIC BODY OF WORK

The five partners of Centerbrook Architects and Planners, in Essex, Connecticut, have blazed individual design trails for 23 years, all the while collaborating in a unified firm. Self-described "American pragmatic" architects, William Grover, FAIA, Jefferson Riley, FAIA, Mark Simon, FAIA, Chad Floyd, FAIA, and James Childress, AIA, "solve problems one at a time," says Grover. The partners and recent principal James Coan, AIA, are respected not only for their designs but also for their willingness to involve clients and users in the design process—a trait learned from their mentor, Charles Moore. One result has been long-term clients; indeed, more than 80 percent of the firm's work is from repeat customers. As Ray Gindroz, AIA, a principal with UDA Architects, states in his nomination of Centerbrook, the firm has "consistently create[d] beautiful architecture which responds to local contexts with human-scale spaces filled with delight."

ABOVE, LEFT TO RIGHT: *Chad Floyd, Jefferson Riley, Mark Simon, William Grover, James Coan, James Childress.* RIGHT AND OPPOSITE: *1. House in the Connecticut Hills. 2. Pfizer, Inc. main gate. 3. Pond House, New England coast. 4. Lender School of Business, Quinnipiac College. 5. Neuroscience Center, Cold Spring Harbor.*



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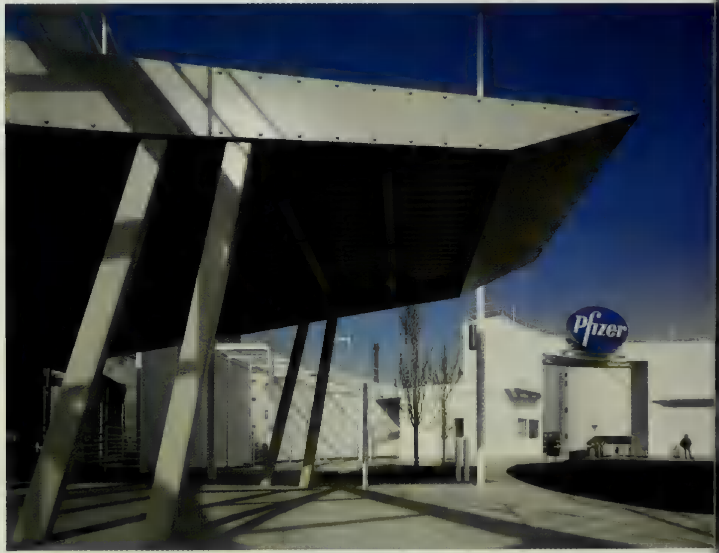

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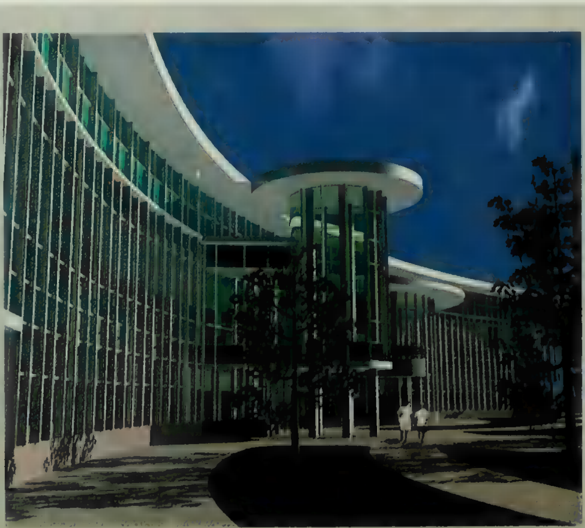
**On the boards at Centerbrook:**
**1. Learning Resource Center, Manchester Community-Technical College, Manchester, Connecticut. 2. Chemistry Building, University of Connecticut, Storrs. 3. Stepping Stones Museum for Children, Norwalk, Connecticut. 4. Campus Center, University of Colorado Health Sciences Center, Denver.**



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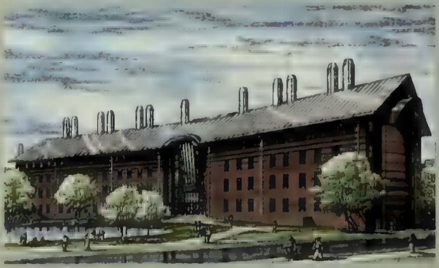

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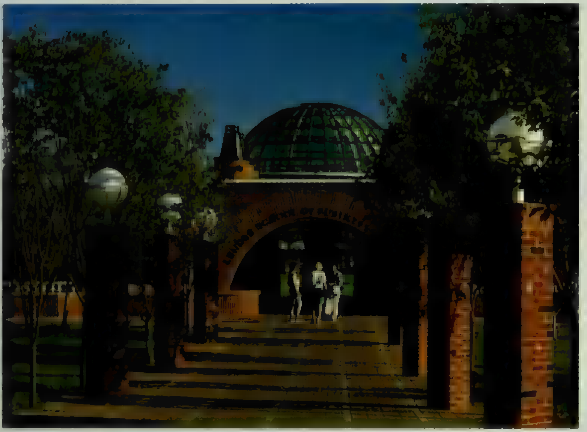

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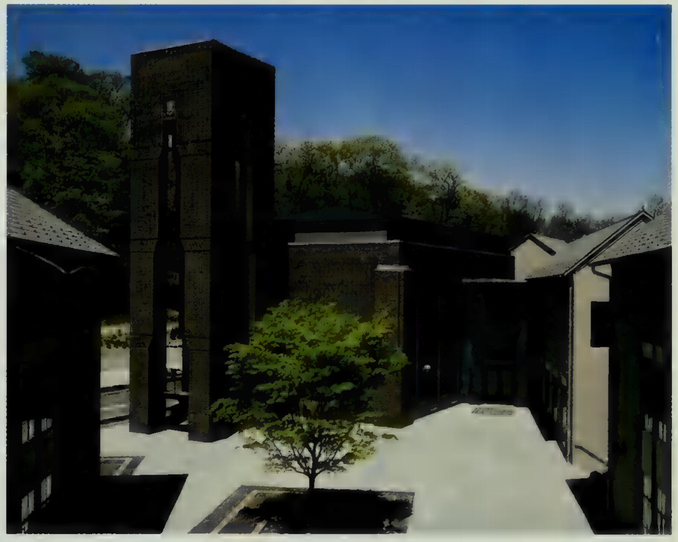

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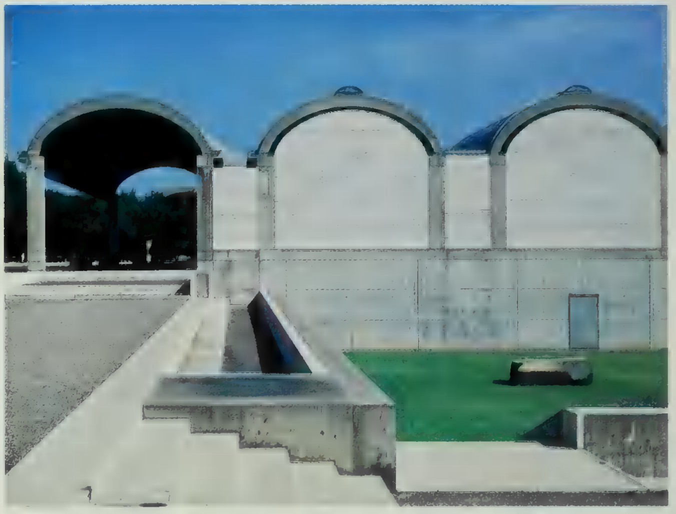
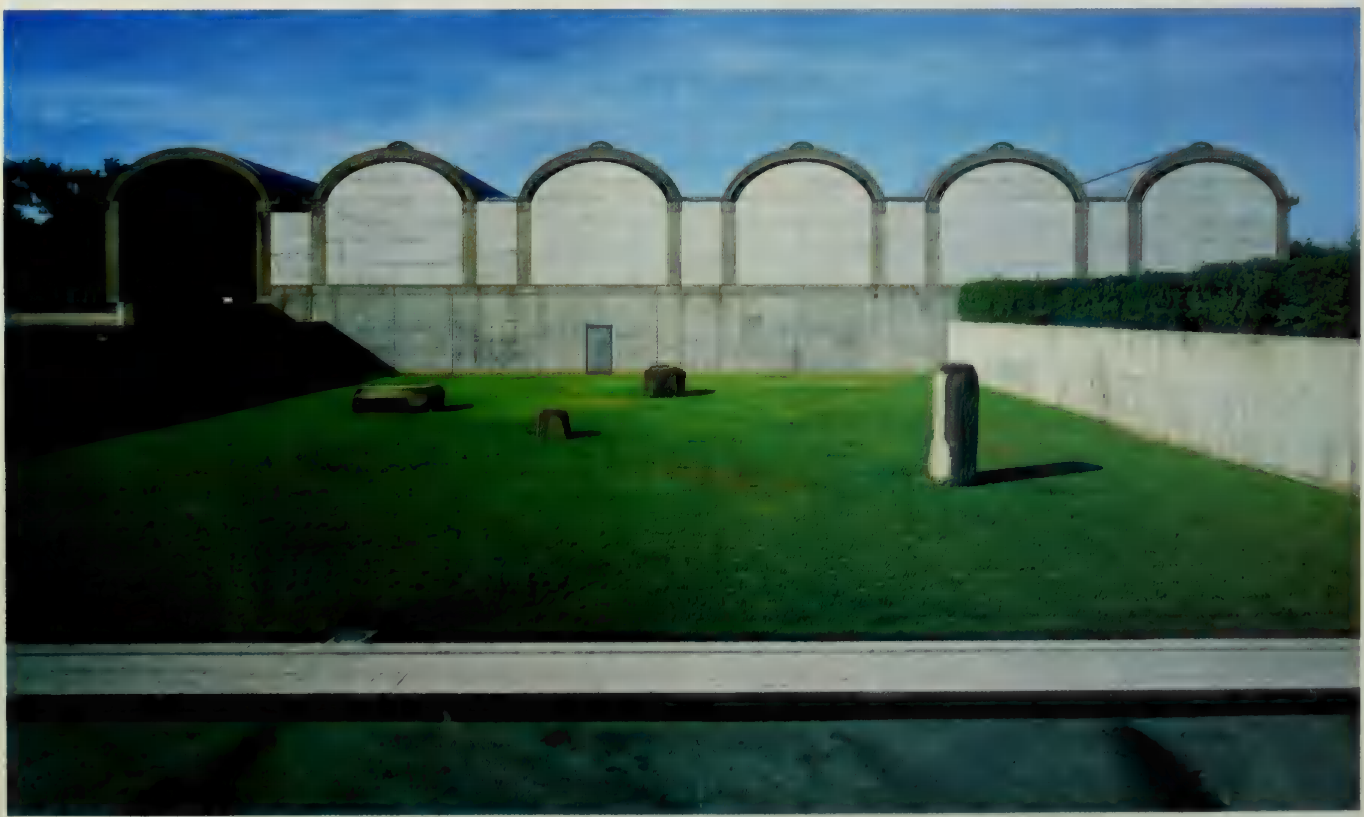
PHOTOGRAPHY: ■ TIMOTHY HURSLEY (1,5 TOP); JEFF GOLDBERG/ESTO (2-4 TOP);

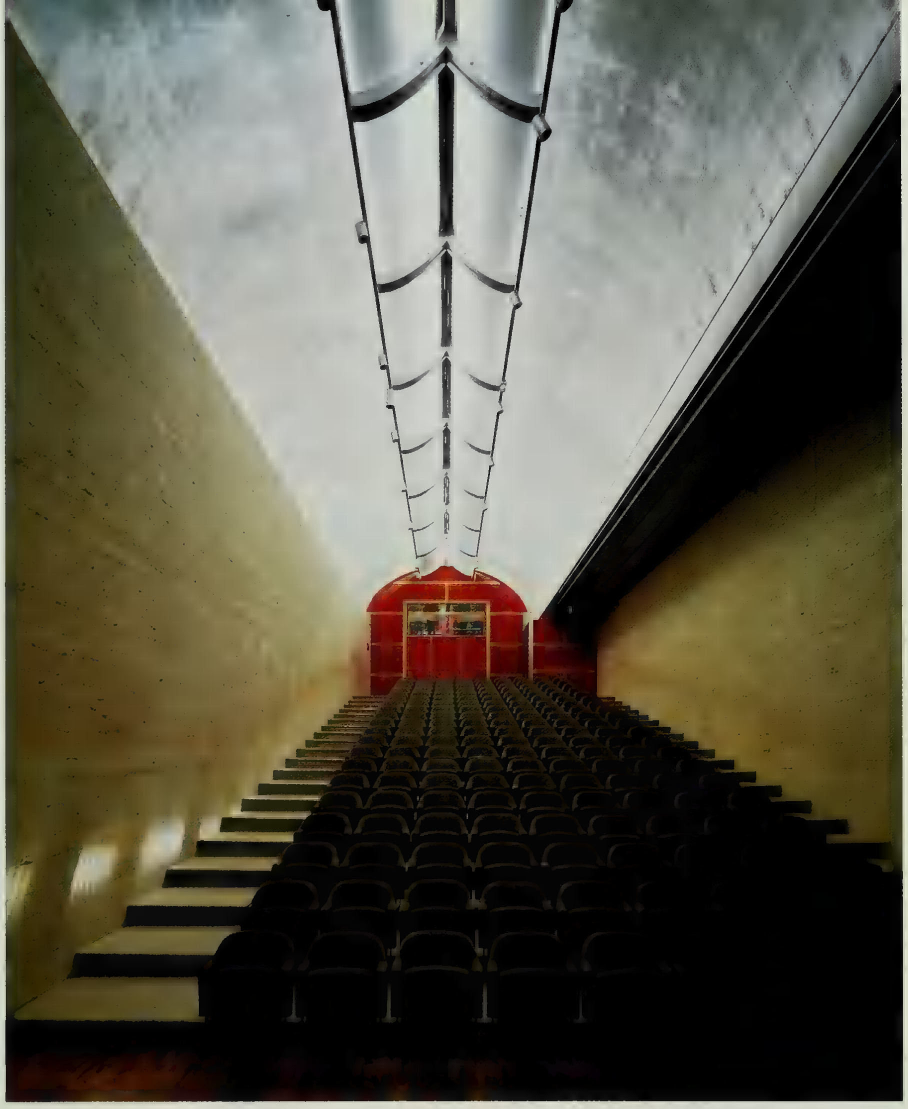
# KIMBELL ART MUSEUM IS HONORED AS THE "TIMELESS" WORK OF A MASTER

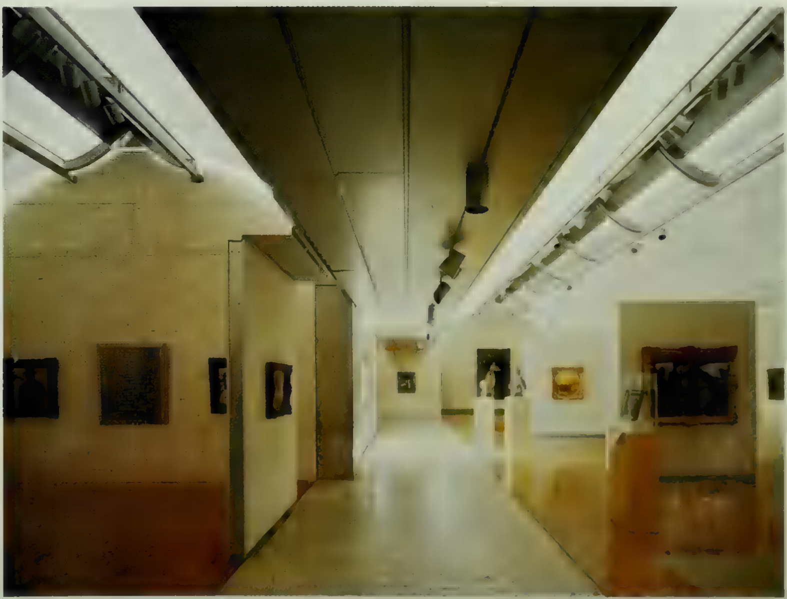
One of the indisputable masterpieces of 20th-century architecture, the Kimbell Art Museum in Fort Worth exemplifies many of the key ideas behind the work of Louis Kahn. The building's simple, powerful forms—curving vaults that work equally well as gallery space, library, and auditorium—linger in one's memory. The famous "narrow slits to the sky," as Kahn called the museum's long skylights, direct sunlight to metal reflectors, which then bounce light off the underside of the vaults. Straightforward volumes, a clear expression of materials, and a knack for using light to articulate form, all hallmarks of Kahn's work, are present in the Kimbell. "The Kimbell Art Museum is the work of a master allowed to apply all of his many extraordinary skills to one building," says Mark Simon, FAIA, the chair of the jury that selected the building for the AIA's 25-Year Award. "The museum shows layers and layers of richness and care, while simultaneously seeming simple, inevitable, and timeless." The 120,000-square-foot museum opened in October 1972 and sits in a 9.5-acre park. Kahn, who died in 1974, envisioned the Kimbell as having "the luminosity of silver."





The Kimbell includes gallery spaces (below), courtyards (opposite, top and bottom), a restaurant, an auditorium (right), a bookshop, a library, and space for operations and offices. While serving art, the building itself is also a work of art.





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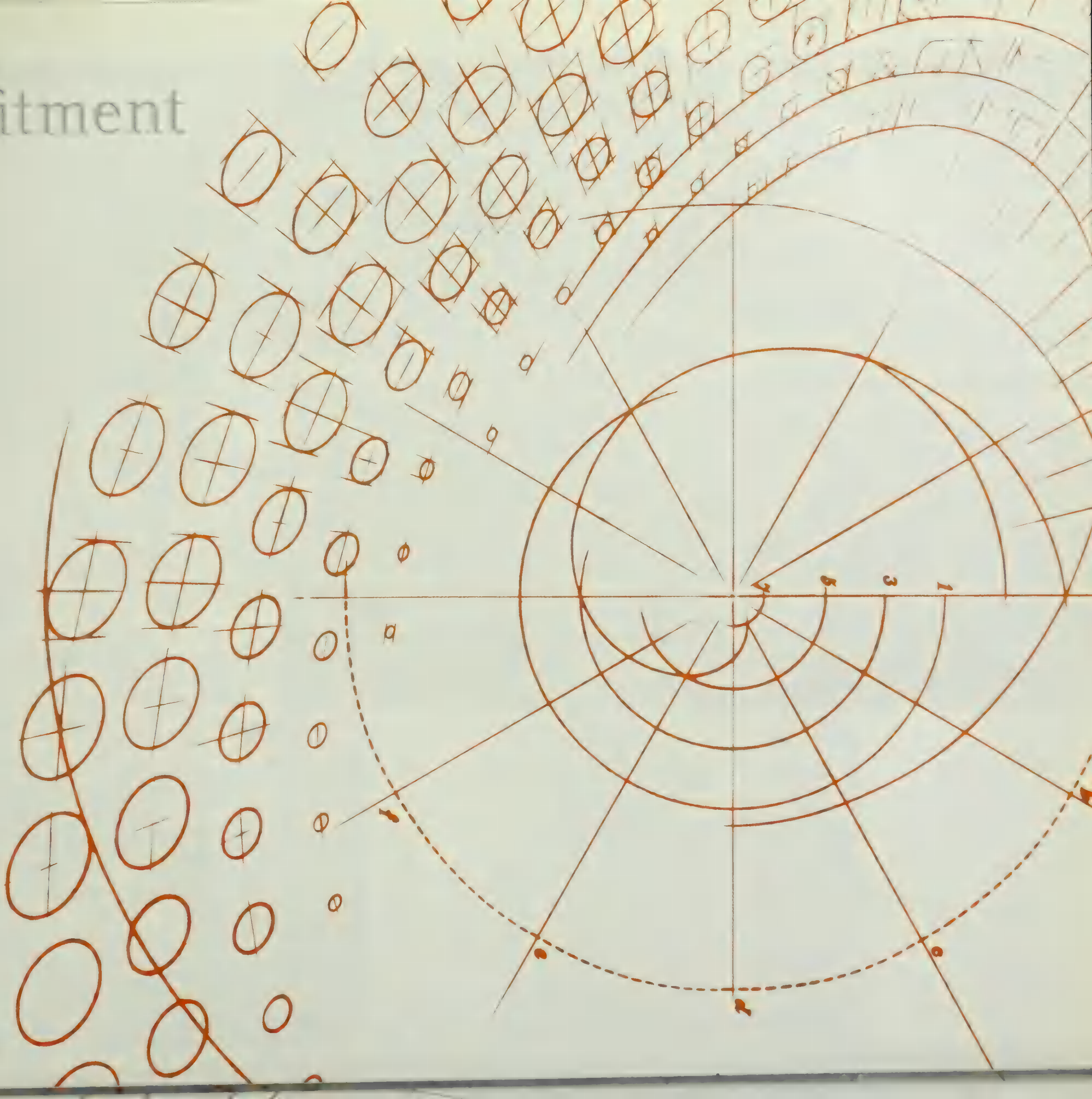
# Commitment



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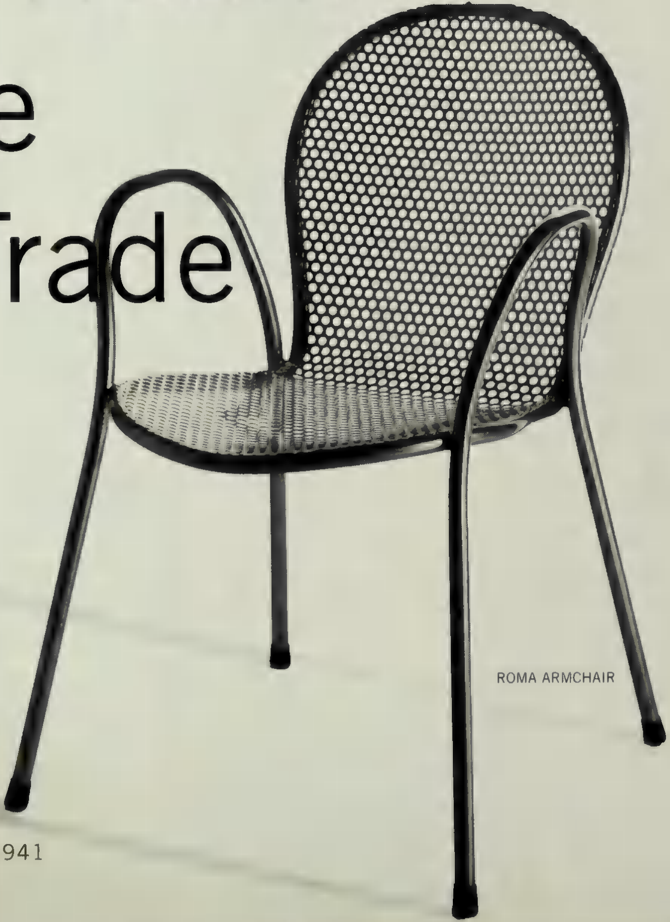

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# Young Architects Profiles

## SIX WHO WEATHERED THE NATIONAL RECESSION OF THE EARLY 1990s ARE FARING VERY WELL IN THE CURRENT ECONOMIC CLIMATE.

**by Lee D. Mitgang**

For many architecture firms, the first half of the 1990s was awash in red ink. As recently as two years ago, the air was thick with talk of too many architects and "downsizing the profession." Architecture students were bailing out of graduate school in droves. Of the 3,500 to 4,000 who did graduate each year with professional degrees, as many as half were heeding the advice of older architects and seeking jobs outside traditional practice—making custom furniture, perhaps, managing facilities, opening hip restaurants in Sante Fe, or turning CAD skills into big bucks in a Silicon Valley technology firm or in Hollywood animation studios.

Today the picture is, in a number of respects, dramatically different. Architecture firms across the country are drowning in work. And young architects—those in their late 20s to mid 30s, who earned their degrees or licenses during a national recession that hit architecture especially hard—are suddenly among the profession's hottest properties, ardently courted because of both their skills and their scarcity.

The national downturn that began in the late 1980s lasted longer and left more scars in the architecture profession than on many other fields. Layoffs dropped total U.S. architectural employment from 157,000 in 1989 to 138,000 in 1992, according to U.S. Bureau of Labor Statistics (BLS) data. No one felt the pain more than young architects, almost invariably the first to be let go at recession-racked firms. Whereas the architectural workforce as a whole declined by 5 percent between 1988 and 1991, the number of intern-architects employed by AIA member–owned firms dropped by 20 percent, a loss of roughly 3,600 positions for young architects.

The recession has left a residue of wariness. Unquestionably, the job picture is dramatically brighter for young architects—certainly for those whose résumés convey talent, energy, versatility, and a modicum of seasoning. Still, many employers seeking to avoid repeating past sins of overhiring are focusing on those prospects who seem most able to hit the ground running and assume the largest share of the project load. Meanwhile, the growing financial crisis in Asian countries is clouding the picture at some firms with heavy dealings in those markets. And despite the more promising job outlook in traditional practice, young architecture graduates have continued to look in large numbers beyond building and design firms for better pay and more security.

"Students used to ask me if there were architecture firms hiring in New York or Philadelphia. Now they ask who I know in Hollywood," says Robert Gutman of Princeton University, an expert in the economics of architecture who estimates that at least one-third of Princeton's architecture graduates are seeking work outside traditional practice.

**AVERAGE SALARIES FOR YOUNG LICENSED ARCHITECTS**

| | 1990 | 1993 | 1996 |
|---|---|---|---|
| ARCHITECT I (RECENTLY LICENSED, 3-5 YEARS EXPERIENCE | 30,000 | 30,000 | 33,200 (+11%) |
| ARCHITECT II (LICENSED, 6-8 YEARS EXPERIENCE) | 33,800 | 34,300 (+1%) | 38,900 (+13%) |
| ARCHITECT III (LICENSED, 8-10 YEARS EXPERIENCE) | 38,000 | 38,600 (+2%) | 45,400 (+18%) |
| MANAGER (MORE THAN 10 YEARS EXPERIENCE; PROJECT RESPONSIBILITY) | 43,400 | 45,300 (+4%) | 53,100 (+17%) |

*SOURCE: COMPENSATION AT U.S. ARCHITECTURAL FIRMS, A SURVEY BY THE AMERICAN INSTITUTE OF ARCHITECTS, 1996*

*Lee D. Mitgang, a contributing editor, was co-author of the 1996 Carnegie Foundation Report* Building Community: A New Future for Architecture Education and Practice. *He was a senior fellow at Carnegie from 1992 to 1997.*

Nonetheless, with unaccustomed prosperity suddenly pushing many design firms beyond their limits during the last year or two, U.S. architectural employment has rebounded smartly from recessionary lows, to 169,000 by December 1997, according to the most recent BLS data. And the outlook seems especially bright for young architects who graduated from school five to a dozen years ago.

"All of these enormous old projects that had been asleep for years are now coming alive," says Frances Halsband, a partner in the medium-size New York City firm of R. M. Kliment and Frances Halsband Architects, which in the last year added four young, experienced architects to boost its staff to 33.

In the eyes of many such employers, these experienced but not veteran architects are highly prized because they can take on a wide range of tasks but don't yet command peak salaries. Yet they are the very architects now in shortest supply, because so many were scared off earlier in the decade by the seemingly dim prospects of traditional practice or were enticed into more stable, better-paying fields. The result for young architects: red-hot competition and even bidding wars of an intensity rarely if ever seen in this field.

In numerous interviews, we learned that the salary hold-downs and layoff threats of just a few years ago have been replaced at many design firms with hefty Christmas and merit bonuses, lunches and dinners with bosses eager to let young employees know how much they are appreciated, and headhunters on the prowl. Most incredibly, one even hears the occasional story of signing bonuses—de rigueur, perhaps, for top law or business grads or college basketball prospects, but a stunning change in fortunes for aspiring architects.

"We're writing offers to potential young employees and getting replies from maybe one out of five," says Denis Henmi, a partner of the San Francisco–based Kwan Henmi Architects, which finds itself bidding not only against larger Bay Area architectural firms but also against high-paying Silicon Valley computer concerns hungry for the design skills and technical savvy of young architects.

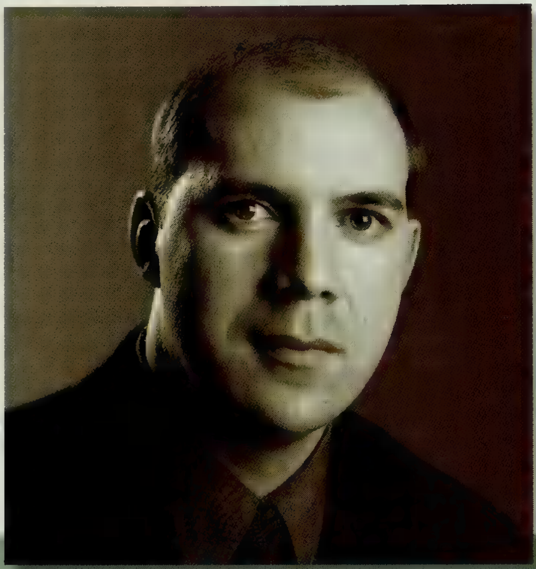
To shed some light on how these younger members of the profession are doing, we asked six—several of whom have already had a lifetime's worth of career ups and downs—to describe their adventures in the now-flourishing job market. Here are their stories:

## Gordon Gill

Gordon Gill entered architecture—or tried to—in 1989, as the field was sinking into recession. He searched in vain for a job after graduating with his first professional degree from the University of Texas, Arlington. Despairing of finding anything in the United States, Gill briefly took a job in Canada before deciding to return to school to ride out the bad times. For his second degree, he entered Harvard University's Graduate School of Design. Even with that Ivy League pedigree, he found his prospects weren't a great deal better in 1992 as he prepared to take his next shot at entering the workforce.

"The number of firms coming to recruit at Harvard had dwindled to a handful. Certainly, none of the big firms came," Gill recalls. A year earlier, in 1991, he had landed a summer job at Skidmore, Owings & Merrill in Chicago, but was paid so little in his pregraduation internship that he wasn't breaking even. Gill's fortunes began to improve as graduation approached. He called back SOM in 1992 for a permanent position, and the firm hired him straight out of school. Gill spent the next five years at the giant firm, quite content.

Then, in the summer of 1997, Gill's telephone started to ring. "I got a lot of calls from people I didn't even know, asking if I would be interested in a new job." One caller, who had been a a colleague of Gill's at SOM, piqued his interest: it was Ricardo Fernandez, a design director of SHG, a large Detroit firm whose specialties include health care, education, corporate construction, and prearchitectural services.



**Gordon Gill**, *a senior design architect at SHG, in Detroit, sat out most of the recession at Harvard's Graduate School of Design.*

"The offer he made was very generous from both a professional and financial standpoint," says Gill. He began work at SHG in late February of this year as a senior design architect. At age 34, with barely six years of job experience, he believes he has a good shot at becoming a design principal within a year.

As part of the deal, the firm also hired Gill's wife, Wendy, an architect from Perkins & Will who also had her share of job offers. "Much of my professional background is in educational building, and since SHG had an education group like Perkins & Will, it seemed like a good fit," she says. Such husband-and-wife hiring agreements have traditionally been rarities at large firms, and SHG's agreeing to it is one more sign of how far firms will go to land young talent. "We're building up quite a good team of young architects," says SHG's Fernandez. "We're recruiting quite broadly, and we have the extra challenge of bringing people to Detroit. There is a lot of work in this city, and our firm has many of the choicest projects."

For Gill, one of the biggest inducements was the prospect of involvement in all phases of the firm's operations and its apparent openness to new directions and ideas. Says Gill: "That's something most young architects would like."

## David Must

As an architecture student at Yale in the late 1980s, while recessionary clouds were gathering, the talk David Must heard from professors was of alternative career paths. It proved prophetic. When he graduated with his master's in 1988, Must had a peripatetic existence. His career consisted of diverse design tasks and marathon job searches spanning two continents.

Hoping to escape the U.S. recession, Must first headed for London and landed a two-year job with a firm building the new British Library. With his British work permit running out in 1990 and the U.S.

TWO YEARS AGO, THE AIR WAS THICK WITH TALK OF TOO MANY ARCHITECTS. ROUGHLY HALF OF THE GRADUATES IN THE EARLY 1990s LEFT TRADITIONAL PRACTICE.

**David Must** *worked abroad for four years before landing a job at the San Francisco firm Anshen+Allen.*

slump showing every sign of worsening, Must spent the next two years in Italy helping construct a cruise ship.

He returned to the United States in September 1992 as the job market in architecture was hitting bottom. Must took to the road and began a five-month-long, cross-country odyssey, papering scores of architecture firms in Pittsburgh, Chicago, Minneapolis, Seattle, and San Francisco with his résumé. "I found that architects never seem to know what their staffing needs are two months out. You just have to show up at the door and hope. If they don't have work, you ask if they'll refer you elsewhere," Must now recalls.

In the winter of 1993, he finally found work in San Francisco at Anshen+Allen Architects and spent the next three years working on hospital design. By 1996 the economic outlook was brightening and Must was hired by the New York City firm R. H. Kliment and Frances Halsband Architects. "The attraction was the firm's very strong design philosophy, competitive salaries, and the chance to see jobs through, from beginning to end," says Must. One of his current assignments is designing a New York City elementary school.

In the last several months, Must says, job offers, with higher salaries, have started to come his way. So far, however, he's staying put. "I now have options. It's quite clear that firms are looking for people of my age and experience, but why not stay where I am happy?"

His boss, Frances Halsband, is well aware of the hot market for employees like Must. The firm recently found itself in a bidding war for another young architect but pulled back when the salary grew exorbitant. "As for keeping such architects," Halsband says, "because things are looking very good, it's not unheard of to give midyear bonuses or promote more teamwork on all phases of projects. Does that make people want to stay? I hope so."

## Jana Gooden Silsby

Jana Gooden Silsby remembers the depressing arithmetic lesson she received while earning her professional degree at Ball State University in Muncie, Indiana. Young architects earn their age—their age, in other words, multiplied by $1,000. "Nobody painted a glamorous picture then," she says.

Even before graduating in 1990, Silsby got a taste of things to come. She spent her internship at Terrien Architects, in Portland, Maine, in the summer of 1988. "Things were very bad," Silsby says. "The firm downsized by 30 percent, and I was laid off. A few weeks later they hired me back for a month because I came the cheapest. It was a big dose of reality."

Silsby sent out hundreds of résumés after she graduated in the summer of 1990. "I couldn't have graduated at a worse time," she recalls. "Nobody was hiring. I was second in my class, and I could only deal with 10 rejection calls a day."

It was Silsby's final thesis that opened the doors to her first job. Her subject was rehabilitation facilities for the blind, and it happened that Graham, Meus, a Boston firm specializing in psychiatric institutions, was looking for a young architect with experience designing health care facilities. The firm hired Silsby that fall as an intern, and, as forecasted, she "earned her age," even a bit less: $20,000. There was worse ahead. In 1992,

**Jana Gooden Silsby,** *a graduate of Ball State University, was laid off twice in less than two years.*

everyone at the firm took a 10 percent cut and, along with five others, Silsby was laid off for the second time in her fledgling career.

Jobless again, she decided that her best bet was to look for work at firms concentrating in the health care sector, her area of budding expertise and one of the few sectors of continued economic strength in the Boston area during the recession. The strategy paid off. Silsby was hired later that year by SBA/Steffian Bradley Associates, a firm noted for its work with advanced computer design programs, which has about 55 staff members and is growing.

Expanding beyond reliance on health care work, business at SBA is now thriving on several fronts, from specialty housing for the deaf and aging to hotels and high-end luxury housing. The firm, which had frozen most salaries during the recession, began handing out raises a couple years ago. And for the younger staff especially, the outside job offers have begun to pour in.

"There has been a lot of active recruiting here because of CAD. Our staff is a commodity because we're real proficient," Silsby says. She adds that as she has moved up the firm's ladder, she is no longer pursued as much by recruiters, since she is perceived more as a manager than a production person.

To keep young staff from straying, Silsby says, the firm began passing out merit bonuses. It also started having the younger professionals present their projects to the rest of the firm. Says Silsby: "It's to recognize good work, a chance to show off a little."

## Vince Hunter

Vince Hunter, a 28-year-old architect at Weihe Design Group in Washington, D.C., can see the change in his profession's newly burnished, more affluent image when he visits his favorite watering holes. "Word gets around," says Hunter, who is unmarried. "Not long ago, when you were trying to meet someone, it was always better to have a line like, 'I'm in real estate.'" Now, he says, "being an architect, purely from a social point of view, is no longer bad at all."

That's quite a change from what he heard as an architecture student at Syracuse University in the early 1990s, where many of the faculty were from New York City and the messages reaching fledgling architects were uniformly bleak. With even the dean delivering jeremiads about the job picture, Hunter recalls, his classmates were leaving school for other fields.

When he graduated in 1993, no one was hiring. "You couldn't get jobs in design. Everyone just wanted to throw you in front of a computer," he says. After months of cold-calling prospective employers, Hunter found a job with a small firm in Norwich, Connecticut. He was barely scraping by on the salary and had to move in with his parents. Casting around for other opportunities, he decided Washington was promising turf and landed his current job at Weihe.

In the last six months, Hunter's experience has differed radically from his previous hat-in-hand job hunt: he's had five offers as well as frequent calls from headhunters. "Headhunters never used to call architects!" he says. The salary offers have been generous, upwards of $40,000, even though Hunter is still unlicensed. Another sign of the times: his firm matched the offers to keep him from leaving. So things are looking up for Hunter these days, in the studio—and at the local bar.

**Vince Hunter** *barely scraped by after graduating; now, though not yet licensed, he routinely receives salary offers of $40,000.*

## Veronica West

At 38, Veronica West is already a veteran of two recessions. She graduated during the first of the slumps in 1982 with her professional degree from California Polytechnic State University in San Luis Obispo. With little help from her school in job placement, it took months of interviews for West to find her first position. Finally, she was hired at Miralles Associates, a small firm in Altadena, California. West rose through the ranks, became a principal, and stayed on for 13 years.

The next recession didn't hit Miralles until the mid-'90s—several years later than most firms—because funds were still flowing into public works, Miralles's specialty. When the downturn hit, however, it hit hard. Despite her senior status, West found herself jobless in midcareer, in the winter of 1996.

If she had to be laid off, 1996 turned out to be a good year for it to happen. In less than a week, West had found a new job at the small but growing Pasadena-based La Canada Design Group, which specializes in higher-education and high-tech structures.

La Canada's open philosophy, in which everyone in the office sees contracts and responsibility is there for the taking, had a special appeal for West as a young architect—along with the firm's scenic location in Pasadena. The firm's recent upsurge in profitability has also meant staff bonuses: "We're all very excited about that," West says.

**TODAY THE PICTURE IS, IN A NUMBER OF RESPECTS, DRAMATICALLY DIFFERENT. ARCHITECTURAL FIRMS ACROSS THE COUNTRY ARE DROWNING IN WORK.**

## YOUNG ARCHITECTS, THOSE IN THEIR LATE 20S TO MID 30S, ARE SUDDENLY HOT PROPERTIES, ARDENTLY COURTED BECAUSE OF THEIR SKILLS AND THEIR SCARCITY.

**Veronica West,** *now 38, was laid off in 1996 after spending 13 years with one firm. She got a new job in less than a week.*

The staff has grown from 11 to 17 since she arrived two years ago, and they are now in the process of searching for more young architects. "We're finding that it's difficult to find qualified people. Just a year ago, job applications were raining down on us. Now we've been advertising for project architects, and we've had only five or ten replies," West says.

## Sharon Ferguson Brittain

In 1984 Sharon Ferguson Brittain became the first female African American to graduate from Ball State's architecture school. The nation and the architecture field were both on the way to recovering from the early-'80s economic slump. Still, Brittain was greeted by an obstacle of a different, more intractable sort as she set out on her first job search in her native Indianapolis.

While many of her friends at school easily slipped into jobs days or weeks after graduation, Brittain's job hunt lasted all summer, with rejection after rejection. "In school," she recalls, "I was told not to expect to make a lot of money, and they were right. I didn't. I tried to find a job in Indianapolis first. Indianapolis didn't have black architects back then. I went on job interviews and got these surprised looks from potential employers."

Reluctant to expand her job search beyond her hometown, Brittain sent applications to three dozen medium and large firms in other cities, but still came up with nothing. Brittain finally received a warm reception in Atlanta, where business was booming and at least some firms were progressive about ethnic diversity as well as women on their staffs. In September 1984 she was hired by Cooper Carry & Associates, an award-winning firm with a large number of interns and a broad range of specialties and projects.

At Cooper Carry, Brittain spent three happy apprenticeship years working on speculative office buildings and on Underground Atlanta, a massive complex of retail shops. Brittain then joined Nix, Mann & Associates—now part of Perkins & Will—where she would stay for six years. She tackled larger projects, including a Veterans Administration hospital, and began to master computer design. Even then, she recalls, she was a rarity in the field as an African American woman.

Personal life forced professional changes in the early '90s: Brittain married, had a baby, and began looking for a job with fewer hours. While on maternity leave, she learned that the state Board of Regents was looking for architects to manage construction and renovation projects on Georgia's two- and four-year college campuses. "It meant leaving the drafting board behind," Brittain says. "But I've been program manager for the last four years, and the experience is just incredible."

Lately, with Georgia's economy relatively flush and an education-minded governor pouring money into new construction, Brittain has had her hands full. Her office is managing 150 campus projects, and she says Governor Zell Miller is asking the legislature for nearly $200 million to fund new projects. Now that she's empowered to help select architects for those projects, Brittain is a champion of smaller firms, especially those owned by females or minorities.

Having made the transition from employee to employer, Brittain is finding such architects in scarce supply: "We advertised two positions for program managers," she says, "and we didn't get any responses." ■

**Sharon Ferguson Brittain** *had to leave her hometown of Indianapolis for Atlanta to get her first job in architecture.*

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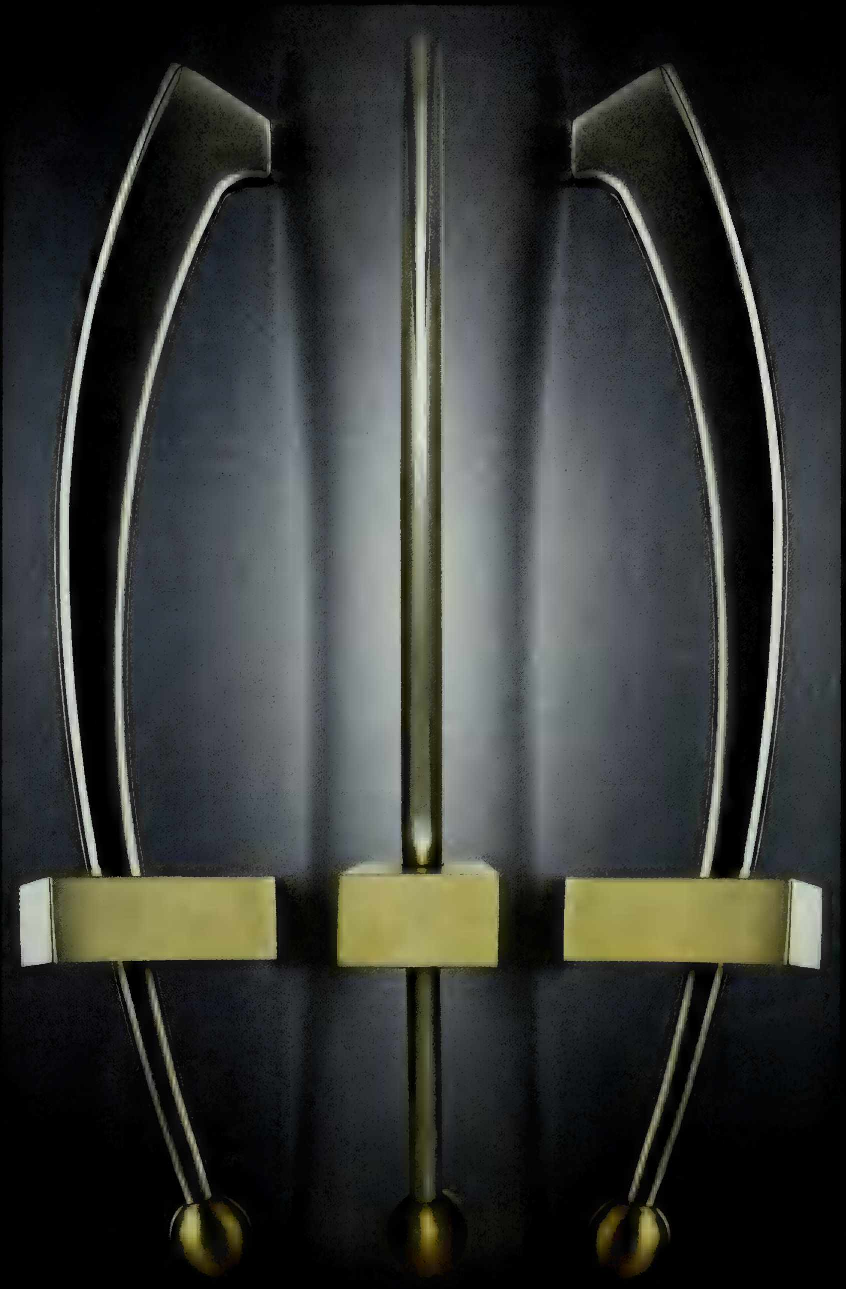

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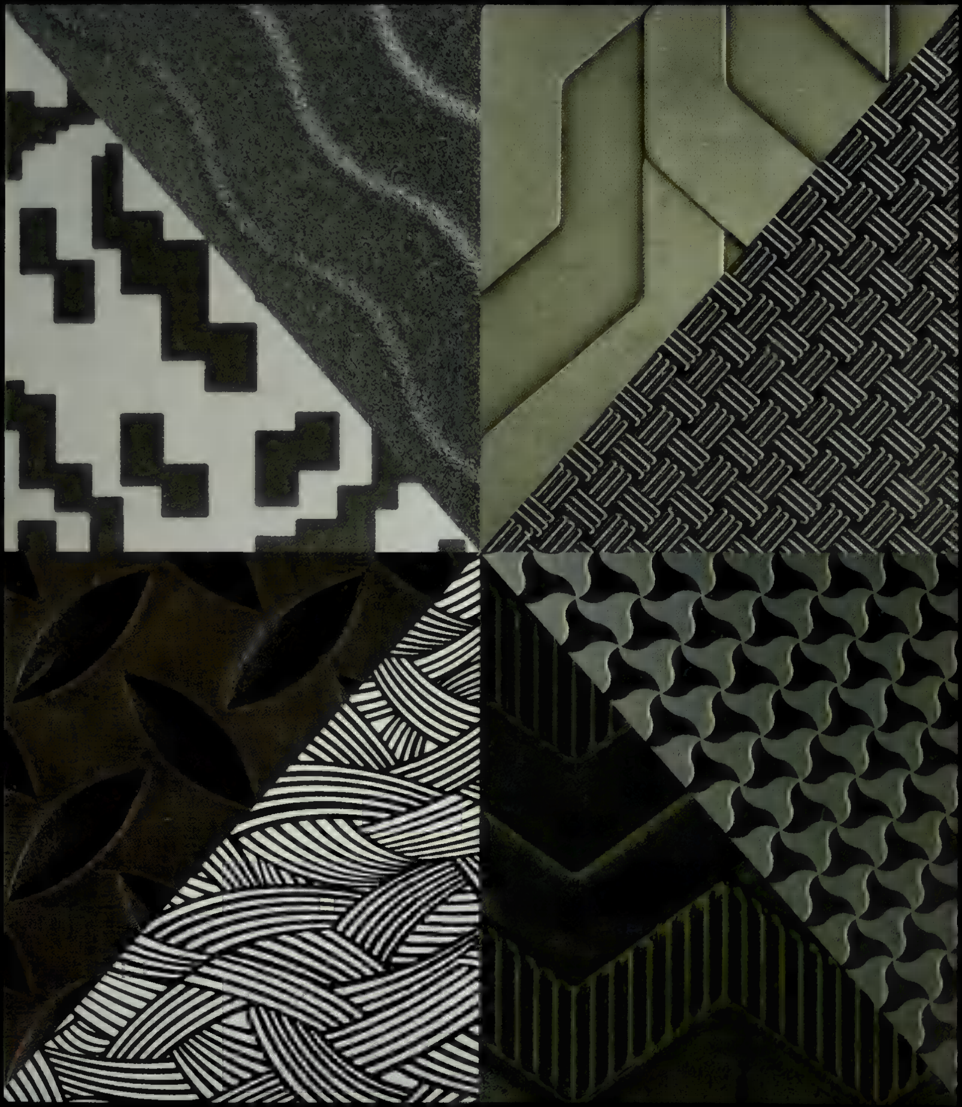

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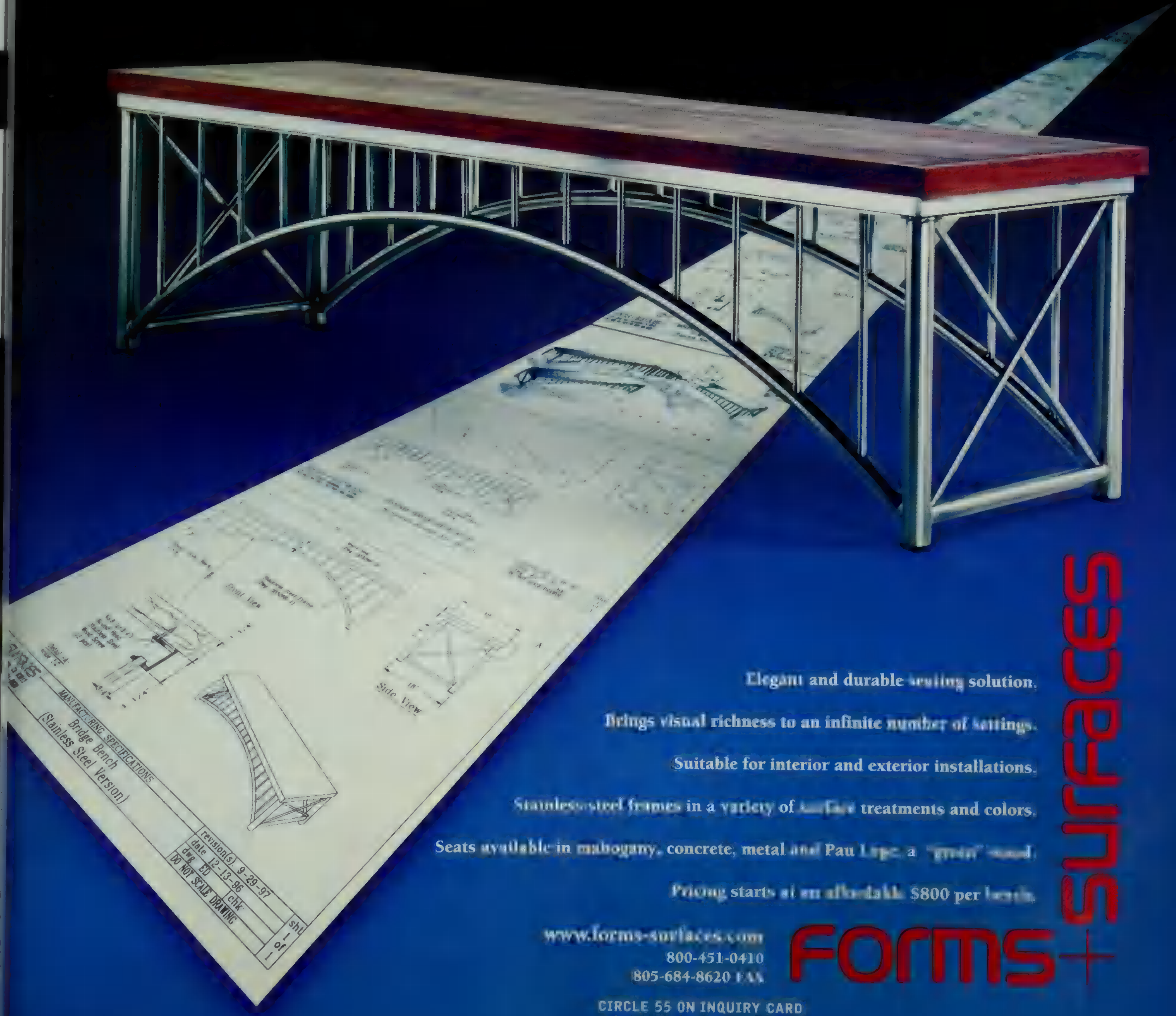

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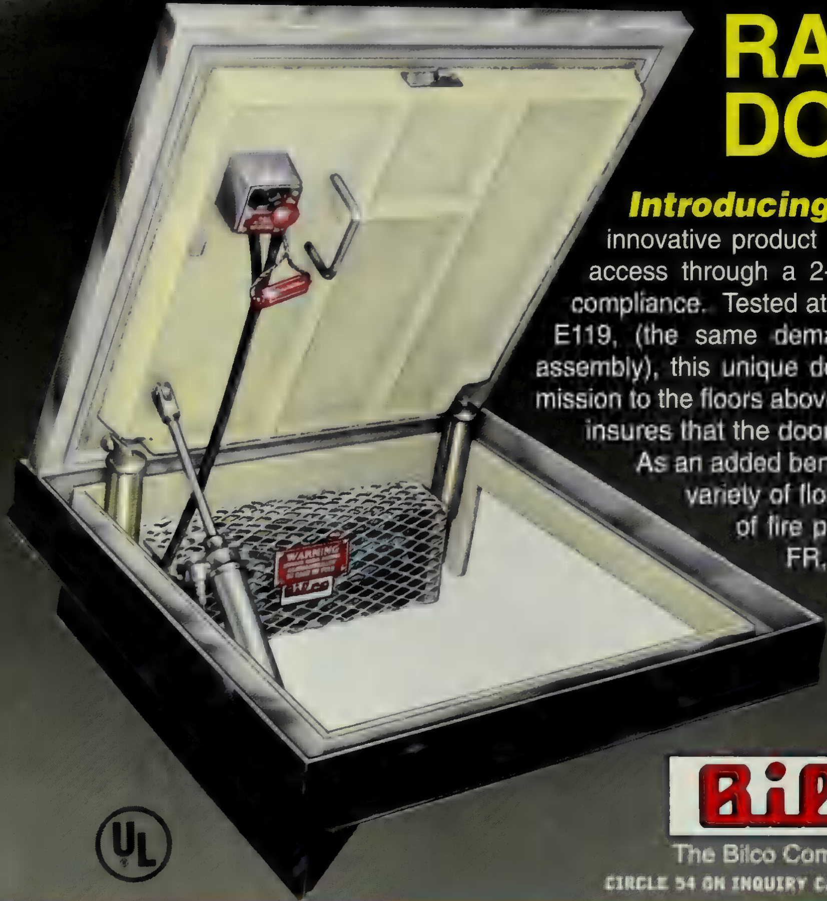

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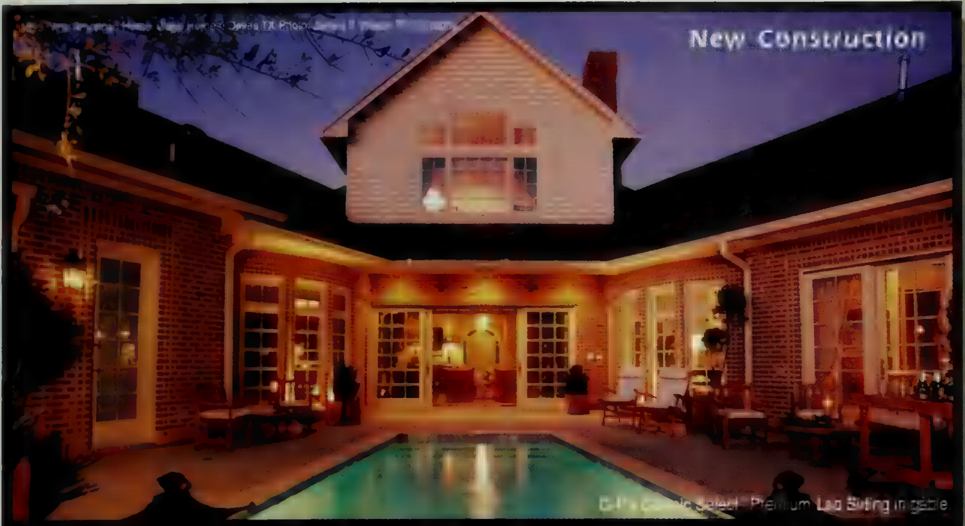

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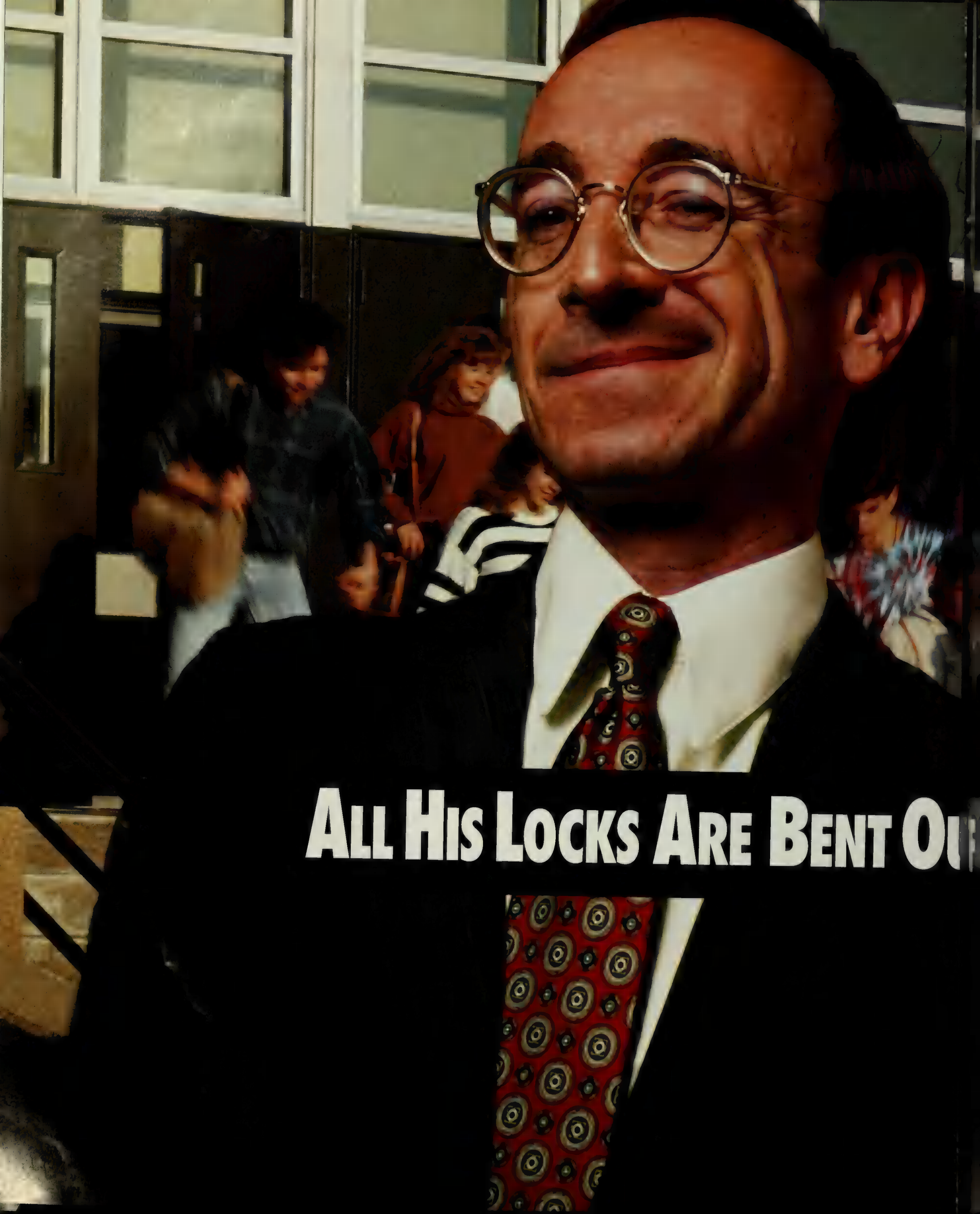
**CIRCLE 57 ON INQUIRY CARD**



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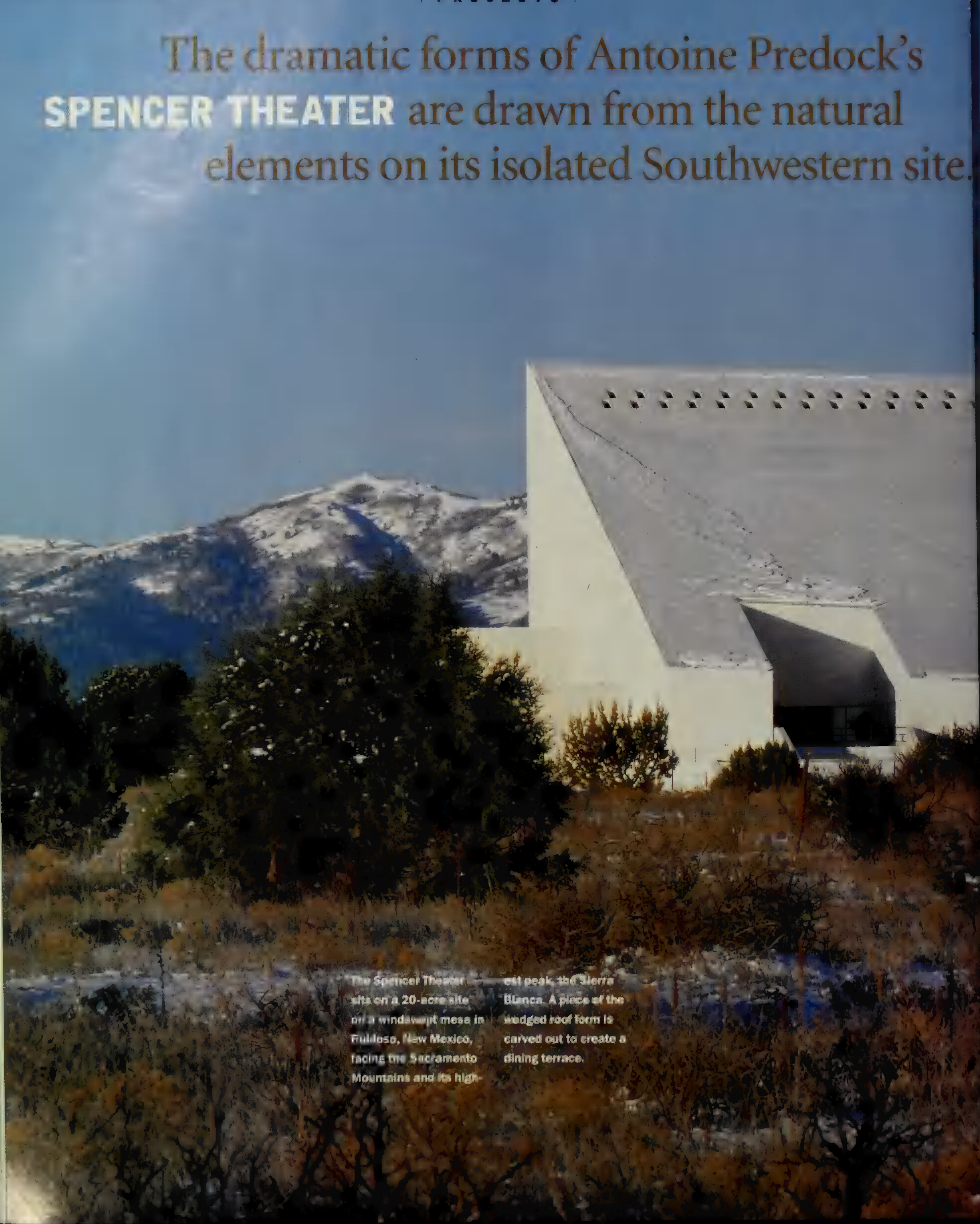
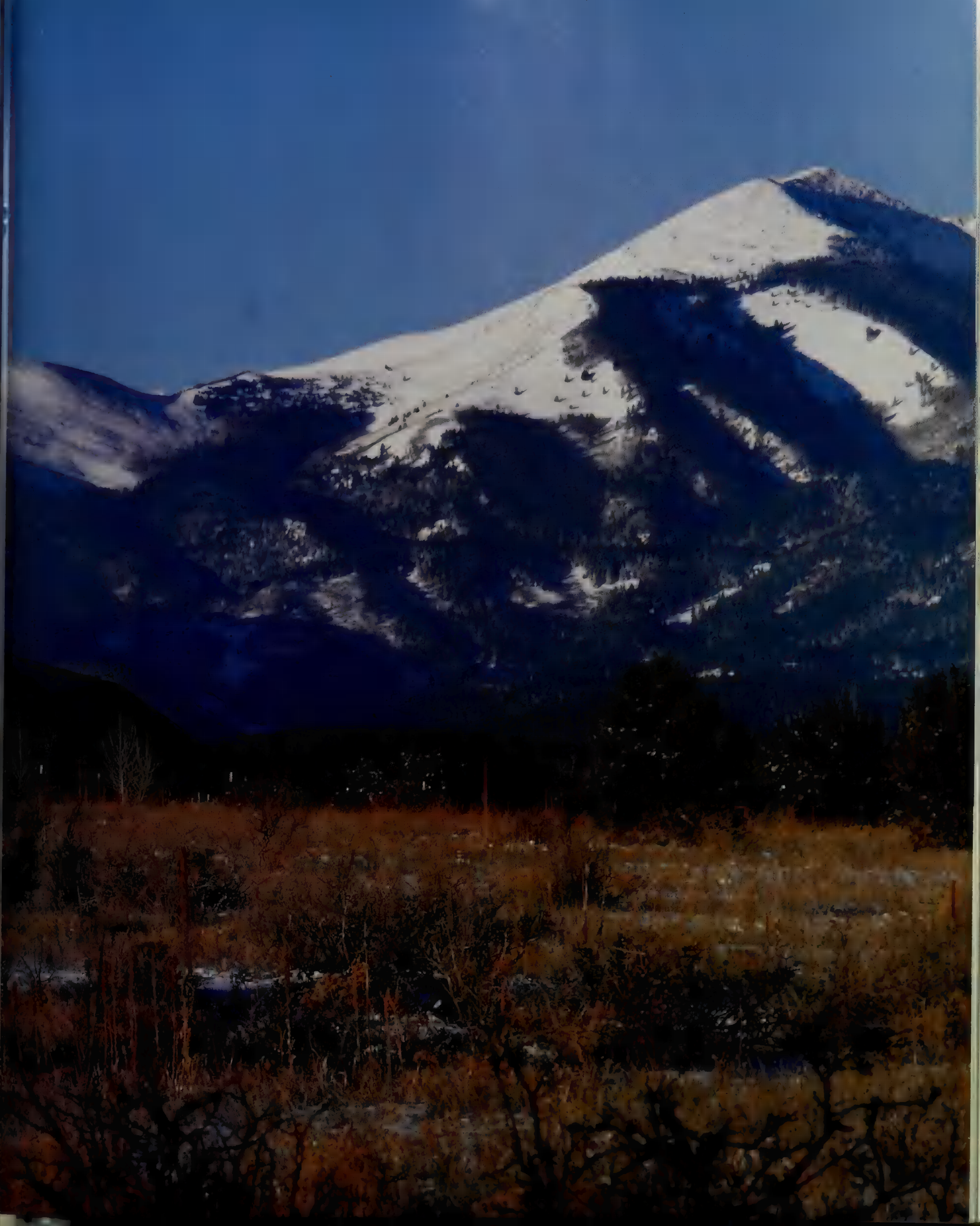
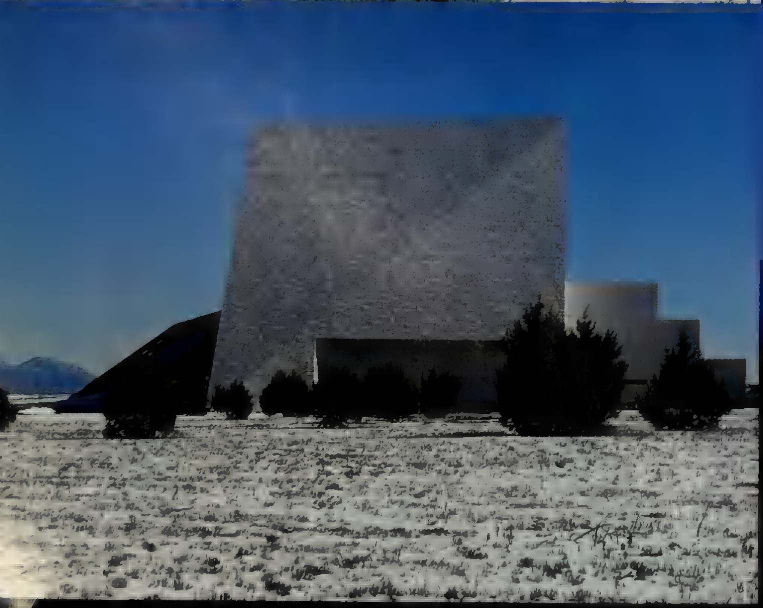
**CIRCLE 58 ON INQUIRY CARD**

# The dramatic forms of Antoine Predock's **SPENCER THEATER** are drawn from the natural elements on its isolated Southwestern site.



The Spencer Theater sits on a 20-acre site on a windswept mesa in Ruidoso, New Mexico, facing the Sacramento Mountains and its highest peak, the Sierra Blanca. A piece of the wedged roof form is carved out to create a dining terrace.





**by Karen D. Stein**

Located in the foothills of the Sacramento Mountains near the Texas border, the remote New Mexico town of Ruidoso is an unlikely place for a performing arts theater, particularly one with world-class aspirations. With a year-round population of 7,000 people that swells to about 28,000 during summer months, the area has long been a hub of outdoor activity: skiing, hiking, quarter-horse racing. But longtime local resident Jackie Spencer, a fan of musical and dramatic performances, longed for other forms of entertainment and decided to do something about it.

Spencer had moved to the area in 1948 when she married A. N. Spencer, a prominent New Mexico cattle rancher. During a trip to Boston to visit her college-age daughter in the early 1970s, Jackie Spencer attended an outdoor concert that proved to be inspirational, though not in the expected way. She recalls sitting on the banks of the Charles River and listening to the William Tell Overture, all the while thinking that if such a pleasurable performance was possible in such an unlikely venue (at least to her mind), then surely the more majestic backdrop of her own backyard had something to offer. Spencer, who has suffered from asthma her entire life, "doesn't do well in cities." Instead, she wanted city culture to come to her.

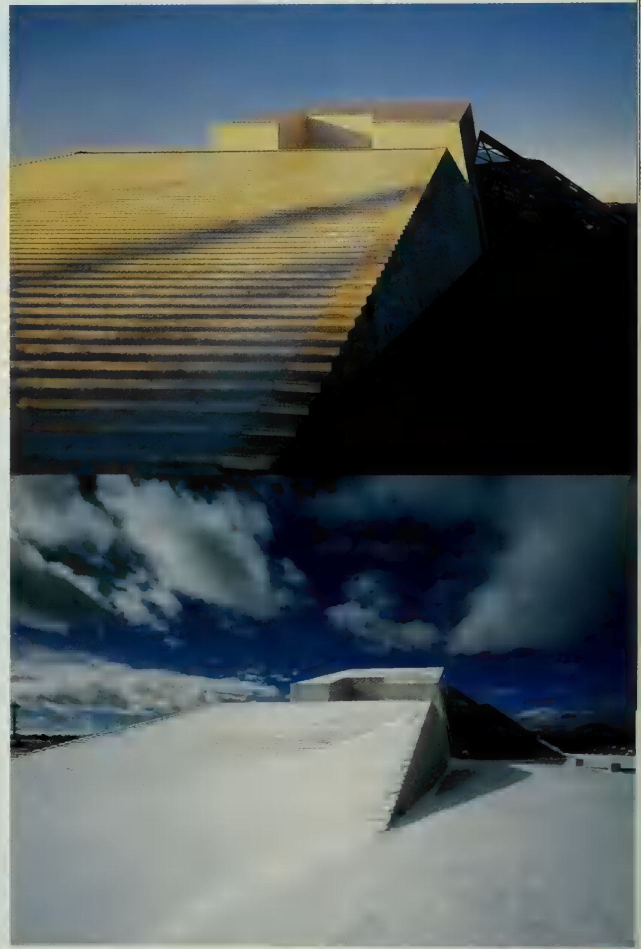
Upon her return, Spencer gradually went about putting her plan into action with the quiet support and advice of her husband. "It took me 15 years to put together enough money," Spencer explains of the $20 million she amassed to build the theater. After examining possible sites in Ruidoso, which she dismissed as "too crowded," she eventually purchased a 20-acre parcel on a mesa between downtown and the even smaller enclave of Alto, New Mexico. "I wanted nothing around it," she says, describing the site's splendid isolation.

She began working with one unnamed architect—"We dreamt up something awful," Spencer admits of their ill-fated collaboration—before setting her sights on someone with an international reputation. She canvassed her contacts, and a friend recommended Antoine Predock, who in addition to having completed performing-arts facilities at Arizona State University in Tempe and the University of California, San Diego, lives in Albuquerque, some 250 miles from Ruidoso—relatively close by New Mexico standards. "I called him out of the clear blue sky," chuckles Spencer.

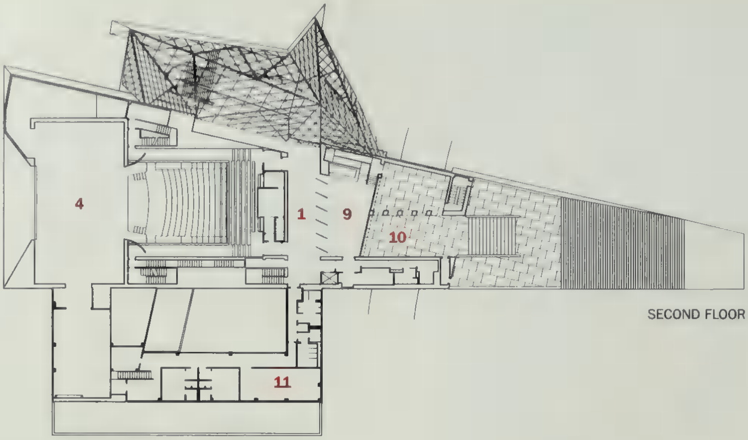
Predock confirms her description. "It came out of nowhere," he says of the commission, which he found striking not only for its dreamlike setting on the barren, windswept mesa but for its private patron with the resources and agenda of a civic institution. "It's the kind of story you hear about: a person of vision who wants to bring something special to an unlikely area. But these stories don't always happen," says the architect,

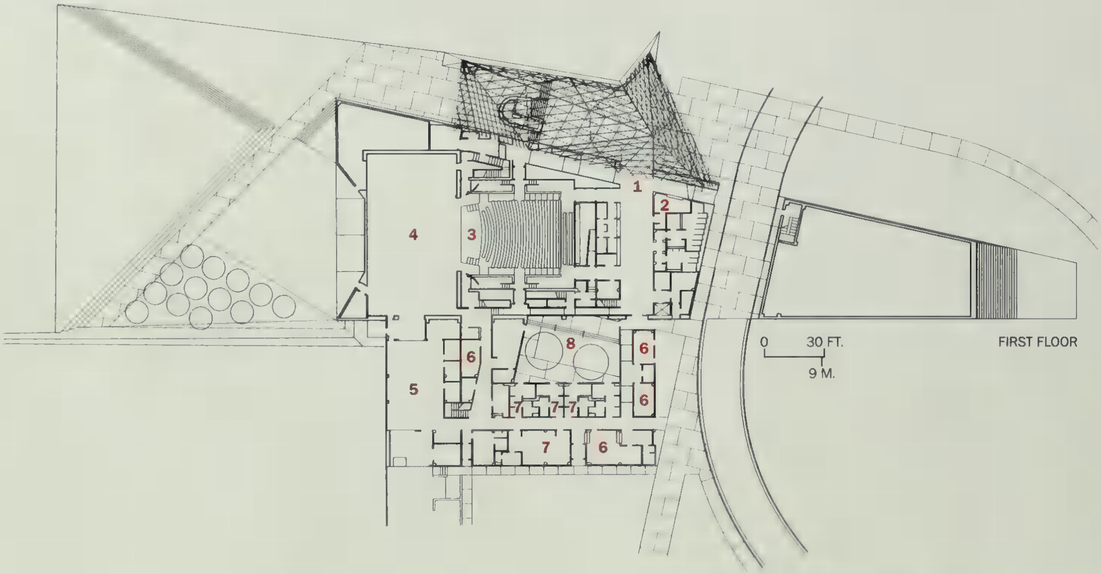
**Project:** *Spencer Theater for the Performing Arts, Ruidoso, New Mexico*
**Architect:** *Antoine Predock Architect—Antoine Predock, FAIA, principal-in-charge; Geoffrey Beebe, AIA, and Douglas Friend, AIA, senior associates-in-charge; Jorge Burbano, Devendra Contractor, AIA, Mark Donahue, AIA, W. Anthony Evanko, AIA, Paul Gonzales, Thea Hahn, Georgina Kish, Jennifer Lein, Robert McElheney, Lawrence Mead, John Morrow, George Newlands, Hadrian Predock, AIA, Kira Sowanick, Michele Cohen, Deborah Waldrip, project team*
**Engineers:** *Paragon Structural Design (structural); P2RS Group, Inc. (mechanical/plumbing); Telcon Engineering (electrical)*
**Consultants:** *Fisher Dachs (theater); McKay Conant Brook (acoustical); Lighting Design Alliance—Alexis Friend (lobby lighting)*
**General Contractor:** *PCL Construction Services*

**The 54,000-square-foot theater takes on a variety of guises at different times of day and night, and in different weather conditions (opposite). During warmer months, water trickles down the roof's 68 steps (below), which evoke the Casa Malaparte in Capri, Italy, and is recirculated to the top.**

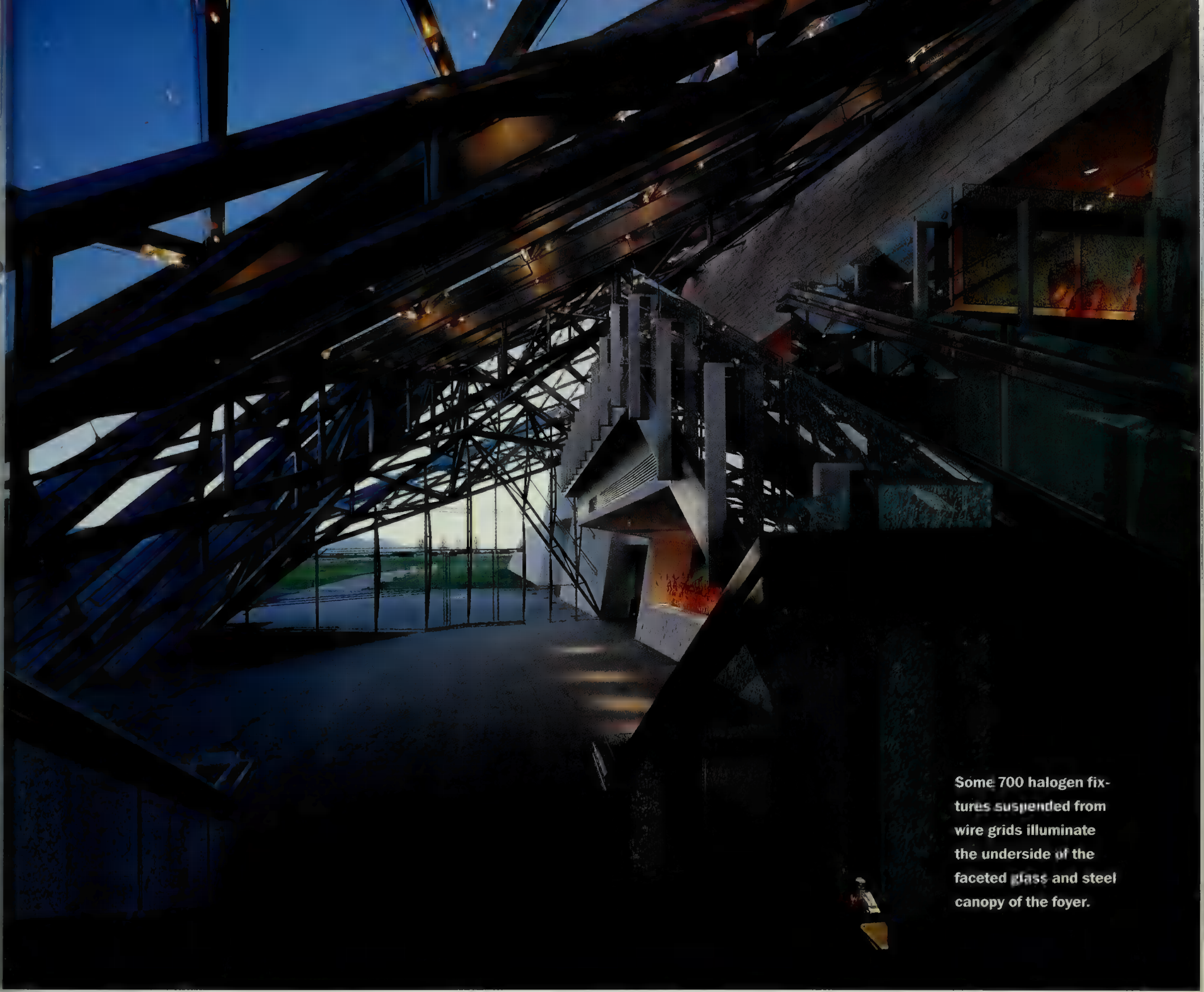


1. *Lobby*
2. *Box office*
3. *Auditorium*
4. *Stage house*
5. *Shop*
6. *Office*
7. *Dressing room*
8. *Courtyard*
9. *Theater club*
10. *Terrace*
11. *Boardroom*





**At an altitude of 7,200 feet, the theater's café terrace (right) remains relatively cool in the summertime. Colored-glass "Onions" on the ceiling are by artist Dale Chihuly (far right).**



Some 700 halogen fixtures suspended from wire grids illuminate the underside of the faceted glass and steel canopy of the foyer.

noting his client's fierce determination to provide something unusual in program and form for her hometown.

Like his client, Predock is a transplanted Midwesterner, and after more than 30 years of living in Albuquerque, his buildings still express a newfound awe of the terrain, vistas, and light of his adopted home. His buildings have often been described as thresholds between the dramatic Southwestern landscapes they occupy and the more prosaic worlds of the parking lots and traffic arteries that service them. But they are also attempts to re-create the area's natural elements—mountain peaks, deep ravines, and stark, rocky outcroppings—in architectural form. Predock's strategy of making buildings virtual landscapes served him well for the Spencer Theater. "During one of our first discussions, Jackie and I agreed that we didn't want a blunt, fly-tower building," explains Predock, describing the typical method of accommodating behind-the-scenes theater space. "She also said that she wanted the building to be elegant, rather than some rugged Southwest number."

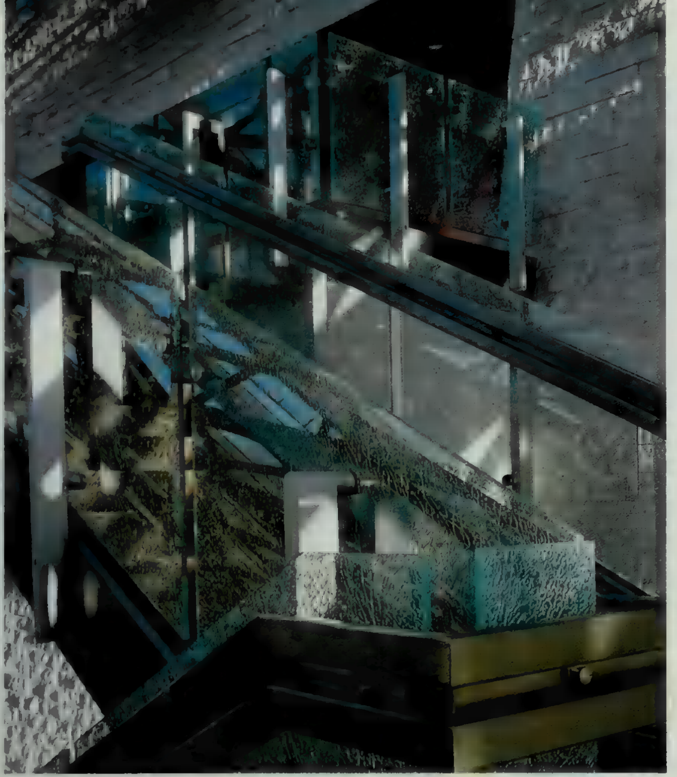
The architect's solution for fitting the big back-of-house into a streamlined form came directly from the surrounding Sacramento Mountains and the range's highest peak, the Sierra Blanca. In fact, White Mountain became an apt nickname for the design he developed for the Spencer Theater, a wedge of bleached Spanish limestone that rises up toward the snow-capped Sacramentos, enclosing a ticket lobby, a single-story suite of offices, and a fly tower with a 70-foot-high gridiron, all in one sweeping monumental form. A view from the side exposes a cutout where a driveway slices through, creating a covered drop-off area to protect arriving theatergoers from bad weather.

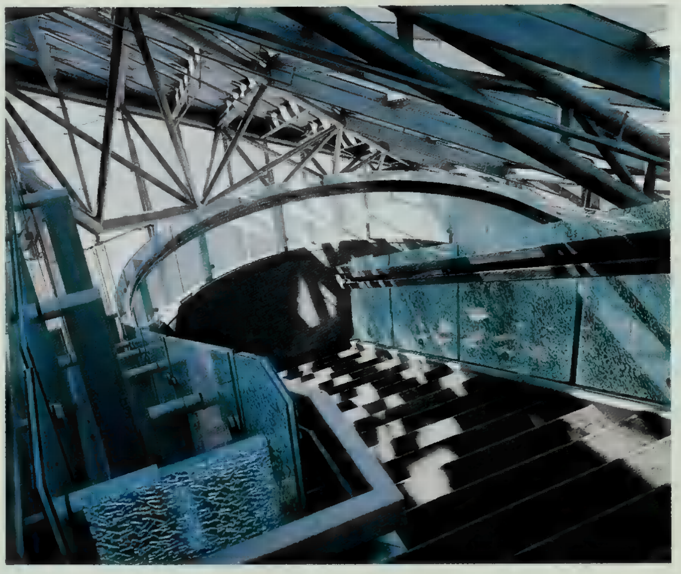
**HERE, AS ELSEWHERE, PREDOCK MAKES THE BUILDING A VIRTUAL LANDSCAPE.**

To create a dramatic entrance for this man-made mountain, Predock affixed a crystalline lobby to the exterior, resulting in a form he likens to a fragment of a Stealth bomber that has crashed into the building. Elaborate wood and computer models were made by Predock's office to

The theater is equipped with state-of-the-art lighting equipment, according to Ed Spurr, director of operations and production, who says he has 1.6 million selections of lighting color to choose from.

For acoustic flexibility, curtains behind the stage can be adjusted according to the type of performance. A generous unloading dock and set-staging area also make large-scale productions possible.





**Glass panels, which have a layer of fractured glass sandwiched between two unbroken layers, reinforce the shimmering effect of daylight streaming through the crystalline structure of the lobby (left and above).**

depict to the fabricator the intricate arrangement of the nine panels of specially cut glass. The faceted glass forms are lined by hundreds of halogen bulbs, making the building a particularly dramatic apparition at night.

The size of the theater was a matter of debate. "An 800-seat theater was Jackie's initial idea," explains Predock. Working with theater and acoustical consultants Fisher Dachs and McKay Conant Brook, the architect determined that with untested audience demand and Spencer's desire for an intimate-feeling space, a hall of 500 seats was a more plausible goal.

> **"FROM 10 MILES AWAY YOU CAN SEE THIS INCREDIBLE CREATURE, THIS APPARITION, THAT JUST SITS THERE ON THE MESA."**

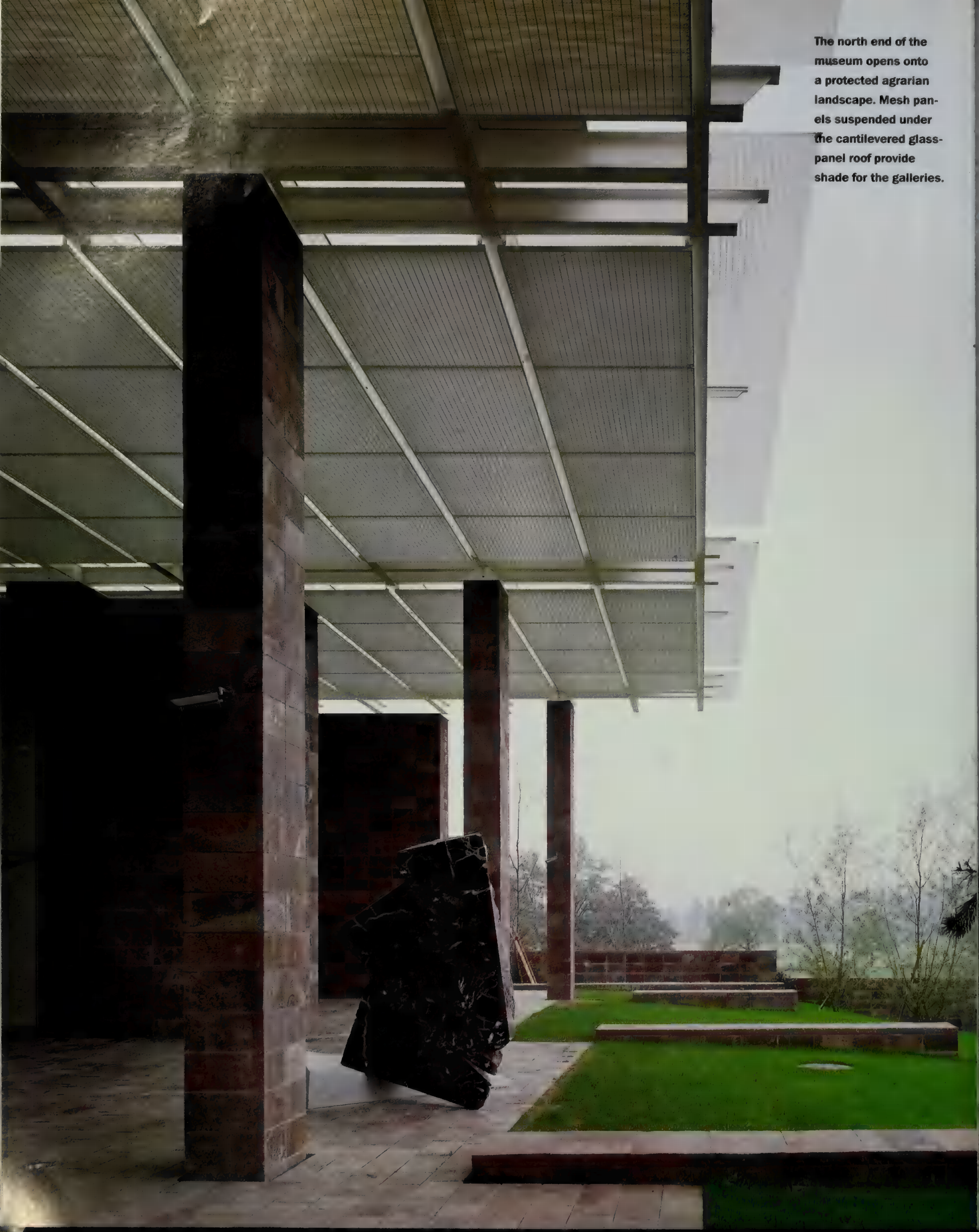
The design was developed with 356 seats on the orchestra level and "finger balconies" wrapping around the space above, for a total of 514 seats. "In this type of theater we try to pull the audience as close to the stage as possible, within the restrictions of building codes," explains Joe Mobilia of Fisher Dachs. The backstage area was configured to hold a series of drapes and partitions that can be adjusted to acoustically alter the space, making it suitable for a variety of performances. Ed Spurr, director of operations and production for the theater, claims there is hardly a performer or troupe he can't accommodate.

Spencer Theater opened last October with performances by jazz musician Dave Brubeck and violinist Nadja Salerno-Sonnenberg. Tickets to the event were gone eight hours after they went on sale. Since then, the theater's twice-weekly program of events, which range from Brazilian classical guitar to the monologues of Spalding Gray, have frequently been sold out, sometimes months in advance. "We projected 70 percent capacity for many of our performances," explains executive director Theta Smith. "But our audience participation has been consistently in the 90 to 95 percent range." School groups are using the theater for children's workshops. And the building is the new tourist attraction of the area. "From 10 miles away you can see this incredible creature, this apparition, that just sits there on the mesa," says Smith. "We have 150 people on any given weekend who just show up and wander through," she reports, adding that she has hired security guards just to monitor all the traffic.

The response to the theater has surprised even its benefactor. "It turned out better than even *I* thought it would," admits Jackie Spencer. Her current plan is to attract as many top performers as possible. The generous dressing rooms arranged around a private courtyard should aid in that effort, says Predock. Spencer also plans to seek financial support in the local community for the theater's $2 million annual operating budget, which, in addition to the entire land acquisition and construction costs, the Spencers have shouldered so far. How often does one person envision and then endow an entire civic facility? "It's very, very, very rare," claims Smith. "I built it for myself," jokes Spencer, explaining her near-perfect attendance record. But the real truth, and the story that all those she worked with on this project are quick to point out, is that she's eager to share it with the world. ■

**Sources**

**Elastomeric roofing:** *Carlisle White EPDM*
**Aluminum fixed, operable windows:** *Western Glass & Panel*
**Skylights:** *Super Sky, Inc.*
**Doors:** *Preferred Door Company, Specialty Door, Inc.*
**Locksets:** *Schlage*
**Hinges:** *Hagen*
**Closers:** *LCM*
**Exit, security devices:** *Von Duprin*
**Door pulls:** *G. Johnson*
**Acoustical ceilings, resilient flooring:** *Armstrong*
**Carpet:** *Burlington*
**Paints:** *Sherwin-Williams*
**Cabinetwork:** *Precision Interiors*
**Furniture:** *Palazetti, Knoll*
**Interior ambient lighting:** *Schroeder Sales, Inc.*
**Water feature:** *Roman Fountains*



The north end of the museum opens onto a protected agrarian landscape. Mesh panels suspended under the cantilevered glass-panel roof provide shade for the galleries.

# The **BEYELER MUSEUM,** by Pritzker Prize winner Renzo Piano, engages in a discreet dialogue between architecture and art.

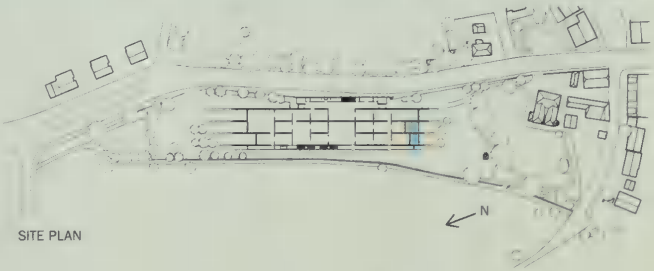
**by James S. Russell, AIA**

Does the Beyeler Museum belong to some bygone era of modern art museums? It's just a series of parallel walls—admittedly unusually handsome walls, constructed of red Argentine porphyry stone—with a plane of glass and white-painted metal hovering over them. Is this simplicity enough when architecture's biggest names are enclosing galleries with great blocks of hewn stone, surmounting museum atria with voluptuously soaring forms, or shrouding sculpture courts with shimmering glass membranes?

Certainly, Beyeler officials must have asked themselves these questions last year when they learned that their opening would fall in the same week in October as the inauguration of the Guggenheim Museum in Bilbao, Spain. Before Ernst Beyeler and his wife, Hildy, decided to build a museum to house their collection of paintings, drawings, and sculptures by artists ranging from Claude Monet to Anselm Kiefer, it was coveted by major institutions. But such was the avalanche of attention accorded Gehry's masterpiece of sculptural form [RECORD, October 1997, page 74] that the Beyeler resorted to chartering its own plane to bring guests from the Bilbao revels to Basel, Switzerland, for its ribbon-cutting.

Luckily the Beyeler's strategy for asserting its place among important European museums does not depend on an initial blast of publicity, since it received little by the standards of 1997 museum openings. Instead it will rely on the ability of the design by Renzo Piano—who has just been announced as this year's Pritzker Prize winner—to display the collection to best advantage. The Beyelers specifically directed Piano to make a museum whose architecture, according to Markus Brüderlin, chief curator, "serves the art and not just itself." Piano nevertheless found his own way to develop an architectural dialogue with the art.

The patrons, who have been art dealers since the 1940s, had originally intended to donate their collection to a major institution, and museum directors in several European and American cities courted them. The Beyelers' holdings include multiple examples of important late Impressionist paintings by Cézanne, Van Gogh, Monet, and Degas, which, according to Brüderlin, "show the direction toward abstract art." Twentieth-century works in the collection range from Mondrian, Kandinsky, Giacometti, and Picasso to American paintings of the postwar era by Warhol, Lichtenstein, and Rothko to 1980s Expressionist work by Georg Baselitz and Anselm Kiefer.



SITE PLAN

In short, it is a blue-chip collection of modern art that local officials and the Beyelers sought to keep in the collectors' home city of Basel. Once a suitable site was found in Riehen, a close-in suburb with the character of a village, the government arranged its purchase. *(text continues)*

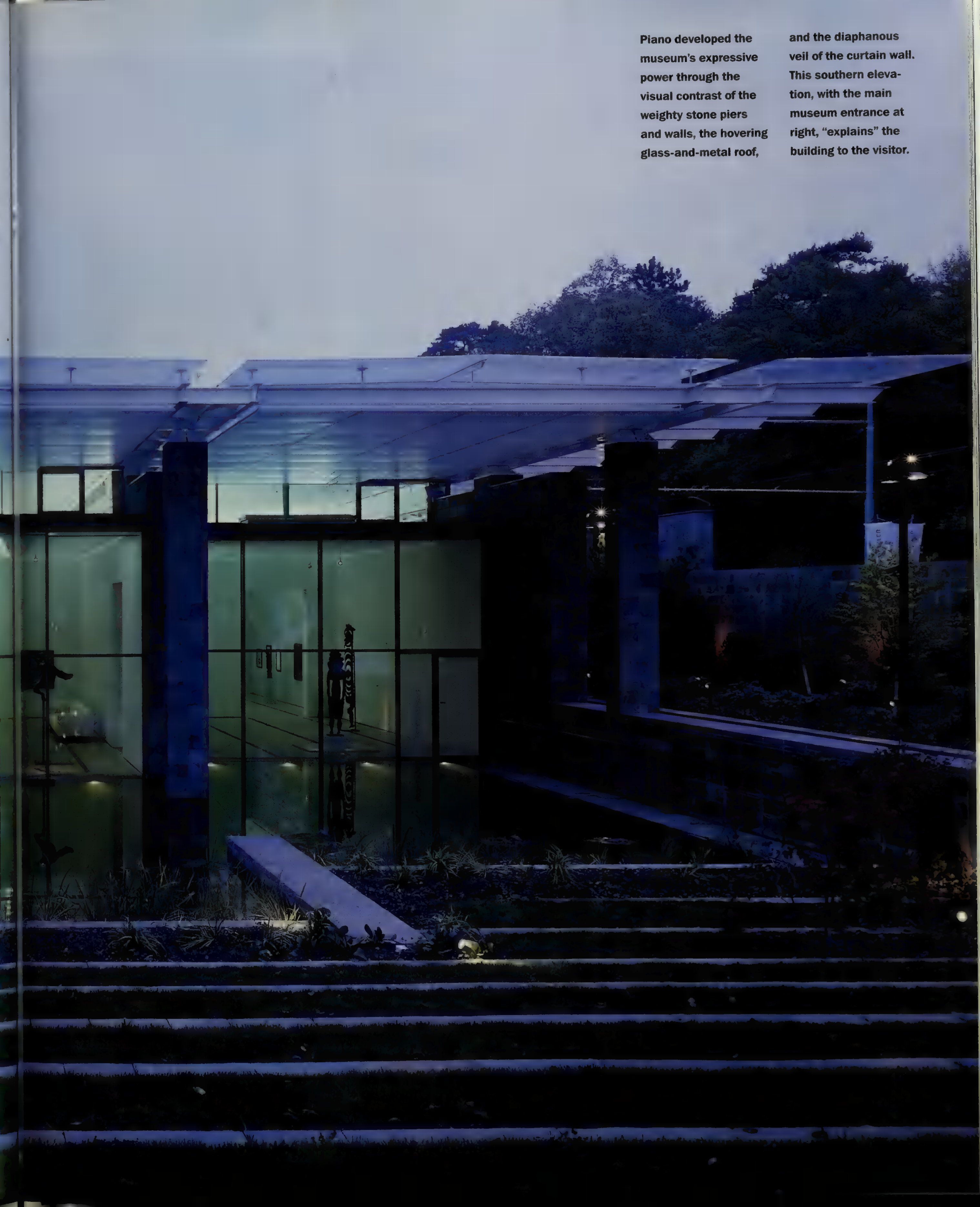
**Project:** *Beyeler Museum, Basel, Switzerland*

**Owner:** *Fondation Beyeler*

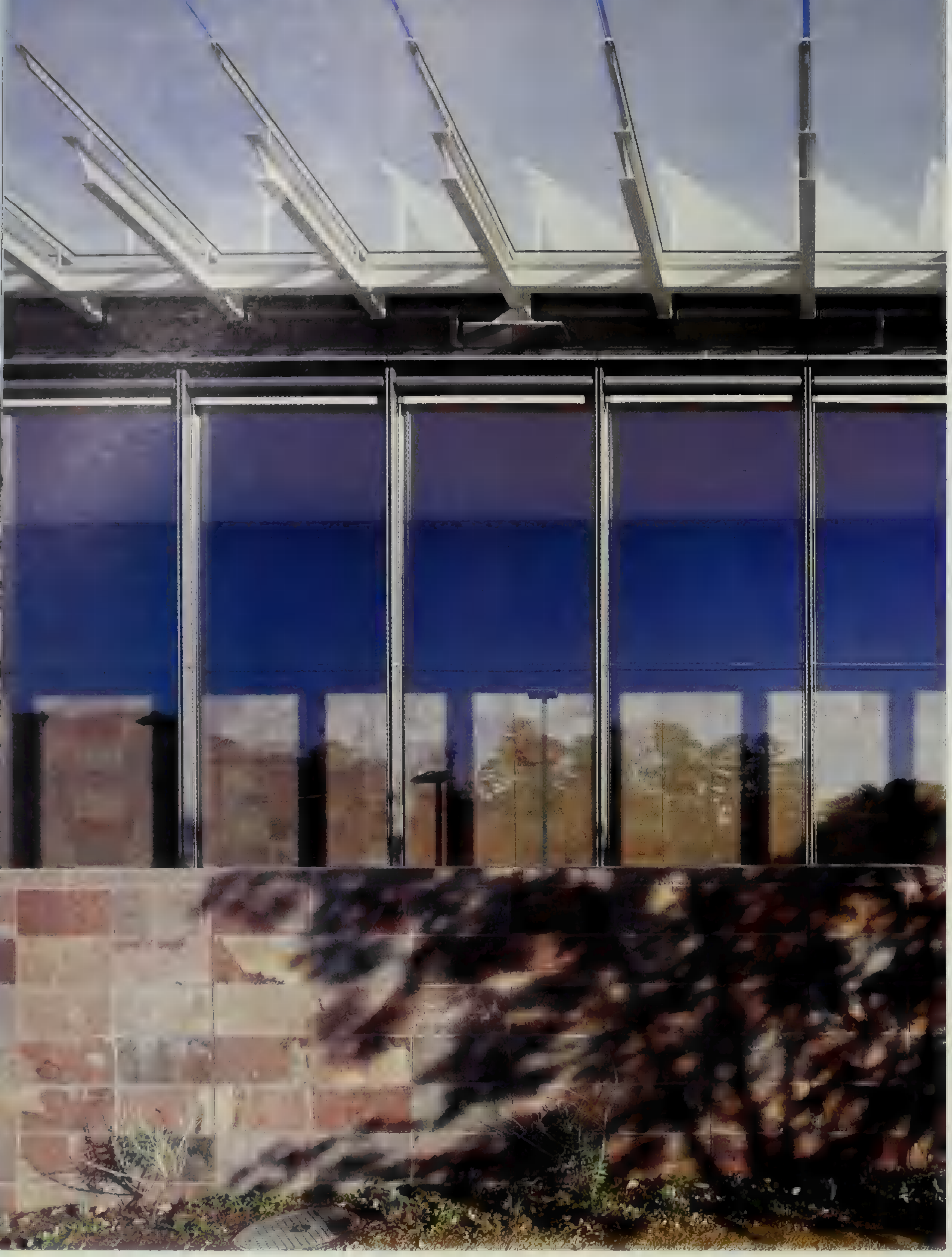
**Architect:** *Renzo Piano Building Workshop/J. Bürkhardt + Partner AG—Renzo Piano, B. Plattner, associate-in-charge; L. Couton, J. Berger, E. Belik, W. Wassal, A. Schultz, P. Darmer, P. Hendier, W. Mathews, L. Epprecht, J. P. Allain, project team*

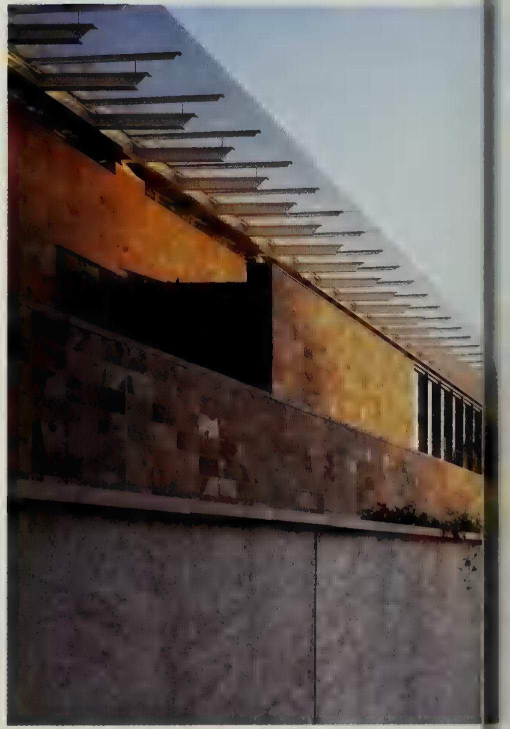
**Engineers:** *Ove Arup & Partners (structural, daylighting); Cyrill Burger & Partner (civil); Elektrizitäts (electrical); Forrer (HVAC); Bogenschütz (plumbing)*

**Consultants:** *Bogner & Lord (museum planning); Arge f. Grünplanung Schönholzer + Stauffer (landscape)*

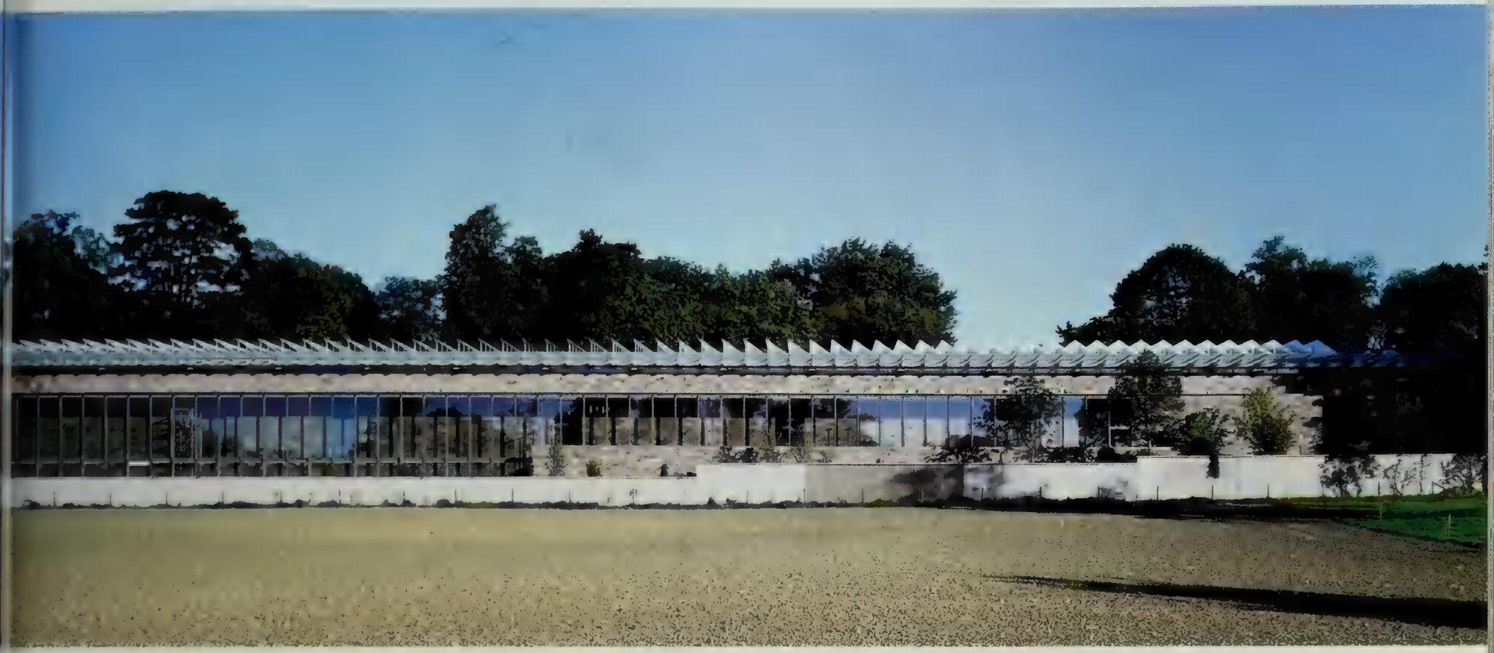


Piano developed the museum's expressive power through the visual contrast of the weighty stone piers and walls, the hovering glass-and-metal roof, and the diaphanous veil of the curtain wall. This southern elevation, with the main museum entrance at right, "explains" the building to the visitor.





**Above: The top of the curtain wall at the winter garden is held well beneath the cantilevered glass roof panels. Left: Layered stone walls enclosing service spaces buffer the museum from the street. Top right: The bulk of the building appears to emerge from the agricultural landscape. Bottom right: Layered walls anchor the west elevation.**



(The Beyelers built the museum; the Fondation Beyeler operates it with assistance from the local government.) At the south end of the site was a much-altered villa and outbuildings within an English-style garden landscape. The villa was remodeled to house administrative offices and a restaurant. The rest of the site rolls downward from the street to the north and west. Farm fields and a tree-dotted swale beyond the site are part of a protected agrarian landscape at the Swiss-German frontier.

Ernst Beyeler explained that he chose Piano as his architect based on the strength and calm he felt the architect had created for the Menil Collection, in Houston, built in 1986. But he also liked the brash urban spectacle of the Centre Georges Pompidou, in Paris, which Piano had designed early in his career, with Richard Rogers (and which he is now helping to overhaul). "We thought the truth might lie somewhere in between," explains Beyeler.

THE SERENITY OF THE DESIGN DRAWS THE EYE TO THE SMALL-SCALE BALLET OF CONNECTIONS AND DETAILS.

But the truth, in museum terms, can be slippery. Museums have gradually become an important expressive outlet for architects and the chief way architecture tells its story in the cultural realm. When museum architecture is dramatic or assertive, however, it can raise the hackles of curators and artists who find their own endeavors upstaged by the grand gesture. On the other hand, the museum that is too hushed, too carefully proportioned or tailored may fail to attract the audience necessary to justify the public support most museums require.

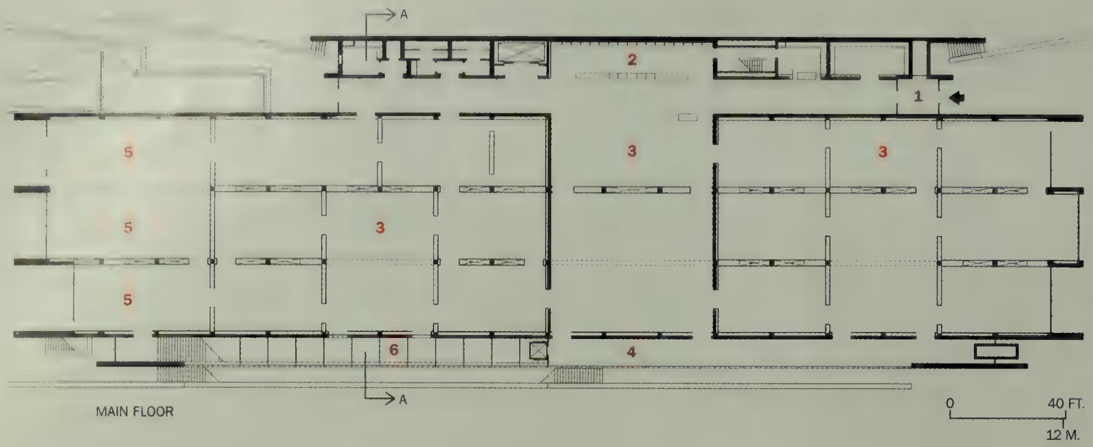
The work of Piano is sufficiently diverse that the design lineage of the Beyeler cannot be clearly traced. One antecedent is the Menil Collection's neutral Miesian box, topped by an assembly of light-refracting lightweight-concrete leaves. Another is the 1995 Cy Twombly Gallery, an addition to the same collection [RECORD, May 1995, page 78], in which heavy masonry walls are roofed with a layered, light-filtering system both more refined and more discreet than the earlier building. But Piano's career over the years has zigged into glitzy expressionism, at the truncated Columbus International Exhibition in his hometown of Genoa, Italy, and zagged to the sculpturally dramatic Kansai Airport in Osaka, Japan [RECORD Pacific Rim, July 1994, page 26].

Piano himself describes his approach as circular, indirect, and intuitive. As he explains in the *Renzo Piano Logbook* (Monacelli Press, 1997), experimenting means "you narrow the circle, like a hawk closing in on its prey." Piano sees much of what he has done as a kind of balancing act between architecture that takes "refuge in pure form" and work that derives from an approach where technology is "an instrument of art." His middle road is to "use technique [i.e., the materials and means of building] to create artistic emotion," and he strives to be like a classical musician in whom skill is so ingrained through practice that it becomes second nature.

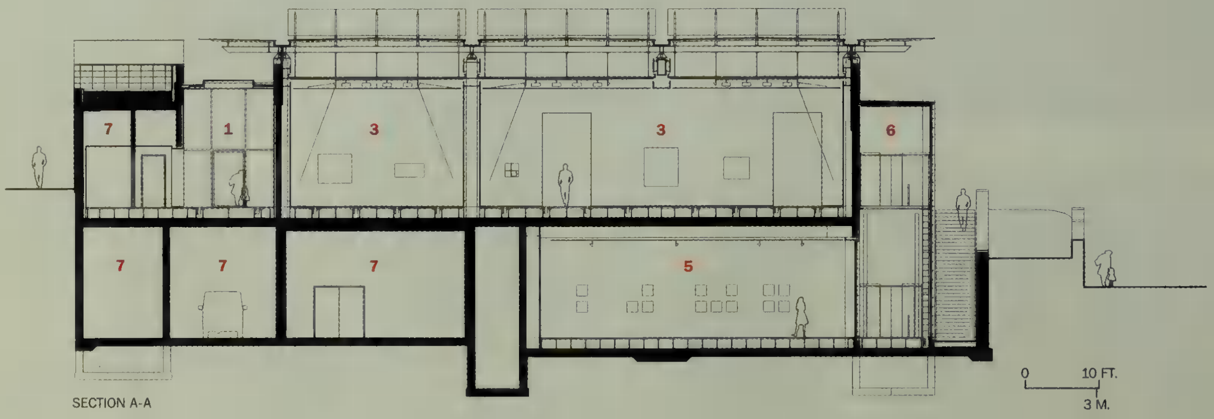
The early schemes for the Beyeler resembled Mies van der Rohe's Barcelona Pavilion in their alignment of four walls. Piano intended to step the suites of galleries between the walls down the site's slope, but the level changes were nixed by Ernst Beyeler, who thought the resultant stairs and ramps would make navigating the museum too difficult. Instead, Piano settled the building lower in the landscape so that it would appear to emerge from the slope on the farm-field side, without being sunk too deep on the entrance side. He buffered the galleries by placing a narrow entry bay and services within a thick layer aligned to the street and adding another narrow buffer of winter garden, outdoor stairs, and services along the western elevation.

It was in the Twombly Gallery that Piano's Building Workshop first developed the aesthetic contrast between the handmade solidity of the masonry walls and the precision of the multilayered glass-panel roof system, but now it seems timid compared with the layering of stone walls

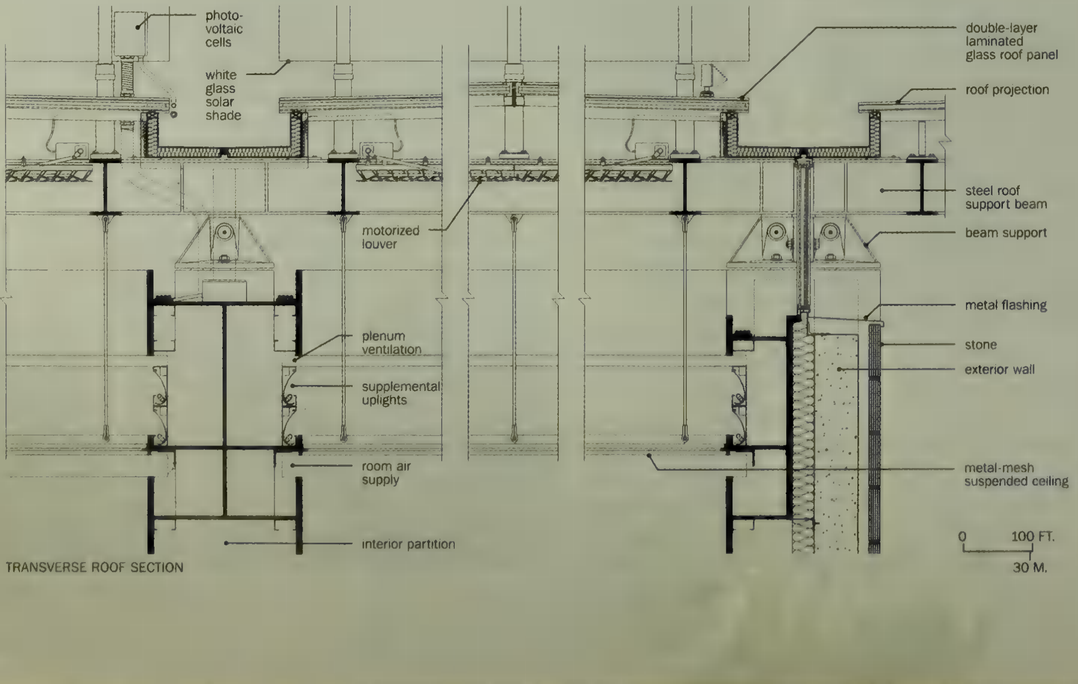
1. *Entrance*
2. *Bookstore*
3. *Gallery*
4. *Winter garden*
5. *Temporary exhibitions*
6. *Open to gallery below*
7. *Support*



MAIN FLOOR

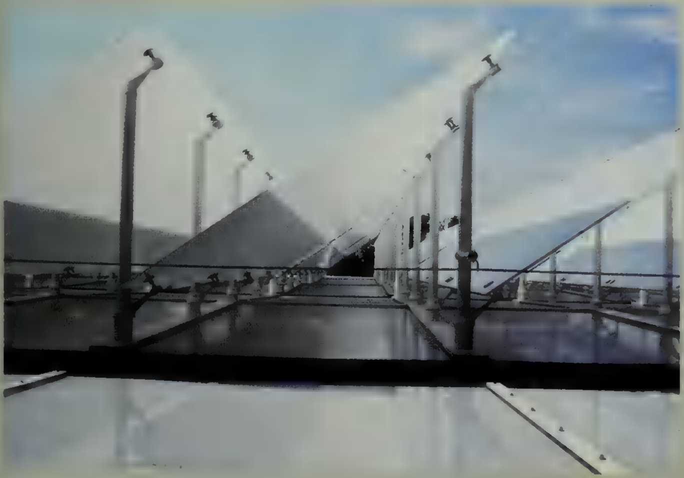


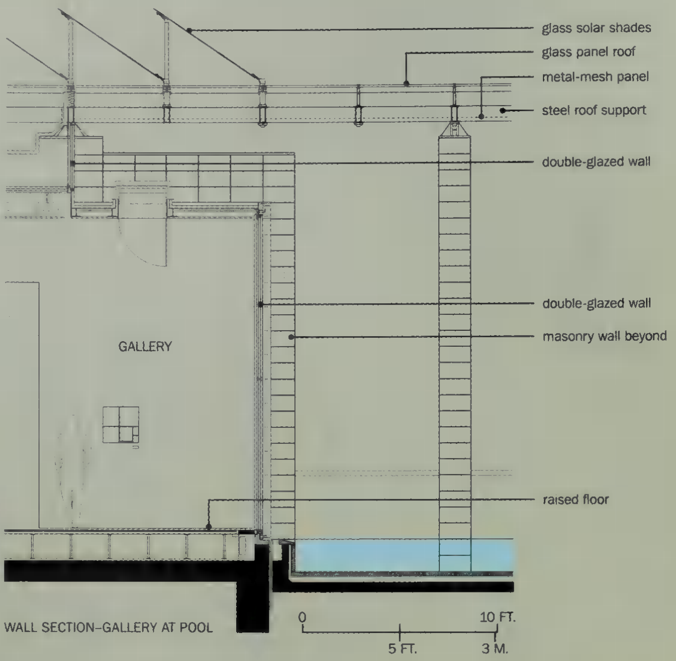
SECTION A-A



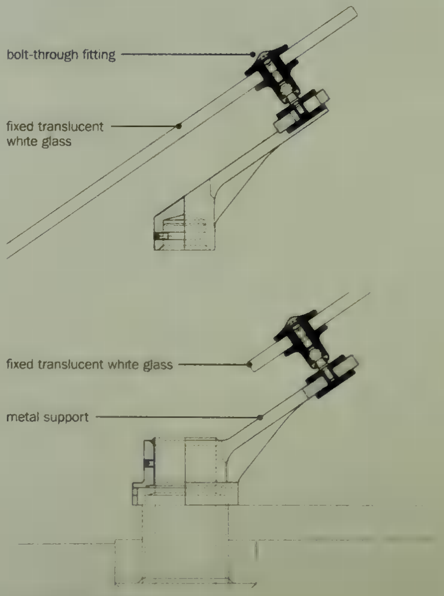
TRANSVERSE ROOF SECTION

**The hovering roof (below) and the limpid interior light create an ethereal effect. The angled translucent glass panels (bottom) permit 30 percent of visible light to pass. Light is further modified in the deep plenum under the glass-panel roof by computer-controlled, motorized louvers triggered by photovoltaic sensors (section details opposite). Metal mesh not only forms a ceiling plane but also diffuses light within the galleries. The section through the south elevation (right) shows the separation between infill curtain wall and structural stone walls.**

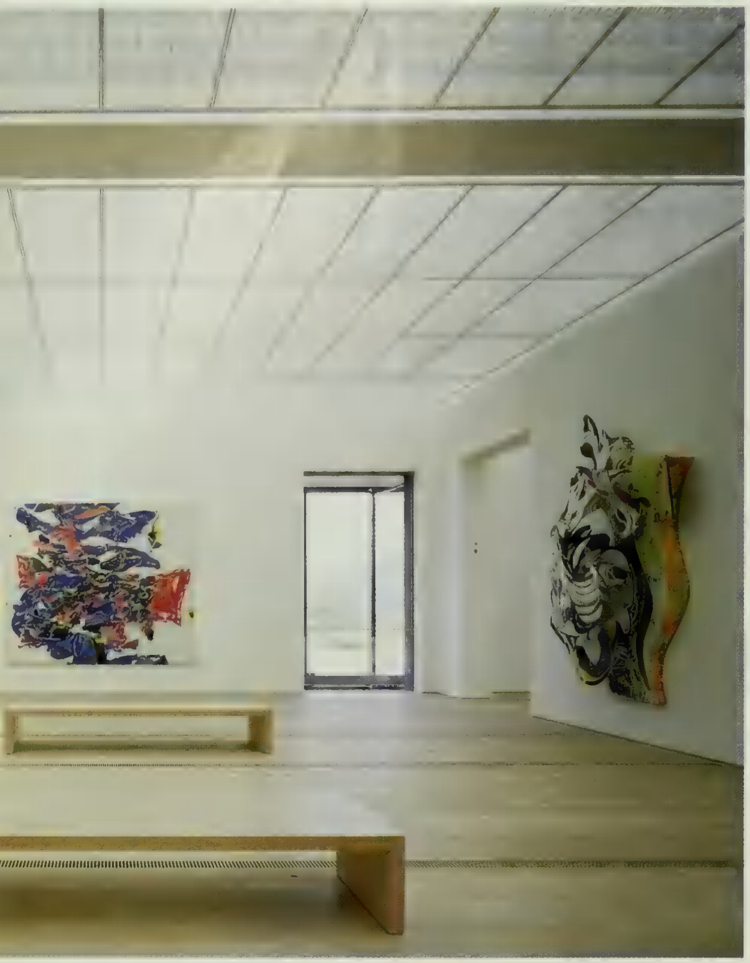




WALL SECTION–GALLERY AT POOL



SOLAR SHADE DETAILS



**The visual permeability of the metal-mesh ceiling makes for a livelier experience than that offered by the windowless "white cube" spaces the Beyeler's galleries resemble. Opposite: A grouping of Giacometti sculptures stands before the garden and reflecting pool.**

and the dramatically projecting roofs at the Beyeler. The transparent glass-panel roof system uses photovoltaics and motor-driven louvers to guide overhead daylight into the galleries in a natural way while keeping light levels within strict curatorial criteria (targets of 80 lux for works on paper and 50 to 200 lux for oil paintings).

THE CEILING OFFERS TANTALIZING GLIMPSES OF THE COMPLEXITY ABOVE.

There are about 145 artworks on view, a number the Beyelers felt most people could comfortably appreciate in a single visit. Only a few of the gallery spaces depart from a carefully proportioned neutrality, though the counterpoint of thick long walls versus thin cross walls discreetly adds variety and aids navigation: one tends to walk south to north, though the galleries can be toured in any order. The thick walls also incorporate mechanical-ventilation ductwork and lighting. A key departure from most gallery design is a subtle one: the metal-mesh suspended ceiling offers tantalizing glimpses of the technical complexity above, but it is just scrimlike enough to keep the attention focused primarily on the artworks.

At a smaller scale, the architecture engages in a lively dialogue with the art. In a gallery facing the reflecting pool the visitor can compare one of Monet's *Water Lilies* with the real thing. The lush garden outside another room helps the viewer appreciate a Rousseau jungle. The expansiveness of the winter garden, a narrow band of glazed space that faces west toward vistas of the agricultural landscape, is intended as a restful pause. The Miesian module stretches for hundreds of feet (an elevator to a lower-level gallery is clad in glass to further extend the vista), but it feels infinite. Close up, hairline-thickness cables delineate a horizontal module between the winter garden's vertical mullions while more pragmatically acting as guides for protective shades.

At the Beyeler Museum, Piano has walked the museum-design tightrope. The building is neither a generic container for neutral, white cubic spaces nor does it engage in the kind of spatial acrobatics that overwhelm all but the biggest and boldest artworks. It's based on an approach that asks the viewer to use his or her senses to assess the relative weight of materials. The serenity of the design is meant to draw the eye to the small-scale ballet of connections and details. According to Ernst Beyeler, the approach works. Unknowingly restating Piano's intention, one visitor told him that it's the only museum she has ever visited that affected her as deeply as music does. ■

**Sources**

**Stone:** *Red Argentine porphyry*

**Glass roof and facade system:** *Vegla, Lanz*

**Metal roof:** *Jakem*

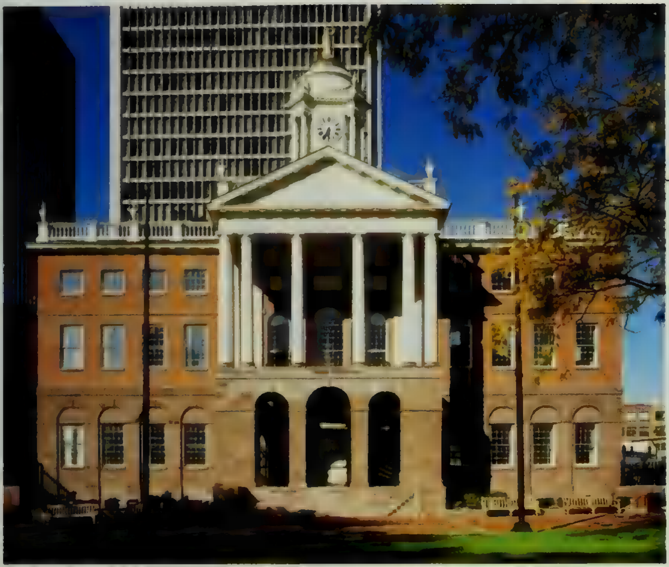
**Metal curtain wall:** *Gerber-Vogt, Preisswerk & Esser*

**Bleached French oak floor:** *Bauwerk Parkett*

**Elevator:** *Schindler*

Senate
Senado

# A research-based restoration of the OLD STATE HOUSE in Hartford, Connecticut, results in rooms from different eras.



### by John Morris Dixon, FAIA

The Old State House in Hartford, Connecticut, is one of those landmarks that have endured many alterations, not all of them terribly respectful. Occupied in 1796 as a rather austere shelter for the state legislature, the Old State House was clearly eclipsed by Richard Upjohn's exuberant Gothic Revival capitol, which opened in 1878. The latter was recently restored to its polychrome glory, a relatively easy operation since the building had been little altered, was well documented, and was still filling its original functions. Restoring the older, humbler structure presented a more interesting preservation challenge than that presented by its grand successor.

After the state government moved out, the Old State House had a second life as Hartford's city hall, from 1879 until a new city hall opened in 1915. Since then it has had a sporadic public role as a setting for meetings and exhibits. Altered repeatedly in the 19th century, the building underwent renovations in 1920 (aimed at making it correctly Georgian) and again in 1970 (when air-conditioning was installed and other systems were updated). The latest restoration was initiated more than 10 years ago by the nonprofit Old State House Association, which leases the structure from the city to use as a historical building museum.

In 1987 the association commissioned Smith Edwards Architects of Hartford to come up with a program for the project while it raised $12 million from private and public sources to carry out the work. Jared Edwards led research and design teams that included the association's executive director, Wilson H. Faude, and restoration consultants Abbott Lowell Cummings and J. Peter Spang. Relying on the research, the key players came up with a design strategy that is controversial among preservationists: to restore each part of the building to the period from which the most physical evidence remained in place.

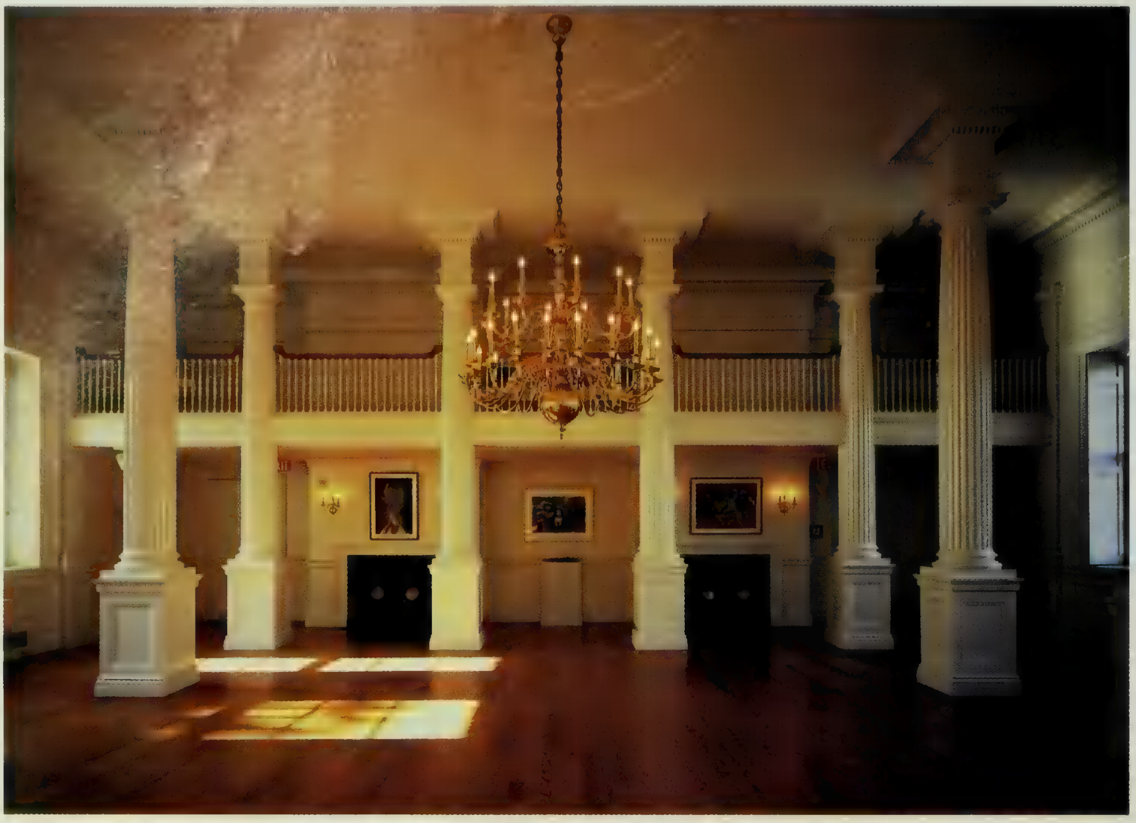
Because of this basic decision, only the Senate Chamber, the least altered of the rooms, was returned to its original form. The House Chamber was returned to its 1880 configuration as the City Council Chamber. Other major public spaces retain the imprint of a 1920 restoration, as does the entire exterior. It would not have been possible to win approval for this piece-by-piece strategy, observes Edwards, without having done extremely thorough historical documentation before anything else. But since it was backed by methodical research and a convincing rationale, the proposal won the support of the association's board, the backing of the city, and the endorsement of the state historical preservation officer, which assured it of federal approval. When some of the donors bristled at historically correct colors or questioned preserving some of the 20th-century alterations, the approved statement of philosophy served as a bulwark. "When push came to shove," recalls Edwards, "the approved strategy assured us that scientific evidence, rather than personal taste, would be followed in all cases."

The visitors' program revolves around costumed historical interpreters impersonating figures who used the building in the past.

## HISTORY—NOT PERSONAL TASTE—GUIDED RESTORATION DECISIONS.

*John Morris Dixon, FAIA, edited* Progressive Architecture *from 1972 to 1996.*

**Project:** *Old State House, Hartford, Connecticut*
**Operating organization:** *Old State House Association*
**Architect and Interior Designer:** *Smith Edwards Architects—Jared Edwards, FAIA, partner-in-charge; Kenton McCoy, AIA, design architect; Maria Watson, AIA, Antonio Matta, AIA, James Carlson, AIA, project architects*
**Engineers:** *Bounds-Kalberer (structural); BVH Engineers (mechanical) Haley and Aldrich (geotechnical)*
**Consultants:** *Rolland/Towers (landscape); System Design Associates (lighting)*
**Restoration consultants:** *Abbott Lowell Cummings, J. Peter Spang (architectural historians); Historic Resource Consultants (historic research); SPNEA Conservation Center (paint analysis); Robert Mussey Associates (furniture restoration)*



**In 1920 the State Supreme Court room was turned into a conjectural Bulfinch interior with bold Doric columns. Its subtle, white-on-white paint treatment, spoiled by uniform white painting in the 1970s, was restored. Since it was impossible to re-create an earlier form of this room—or the first- and second-floor lobbies—it was returned to its 1920 state, serving as an example of 20th-century revivalism.**

Faude sees historic buildings as the stage sets where history was played out, so he considers these performers, who double as guides and guards, logical extensions of the interior restoration. They tell visitors about their characters ("Hello, I am Daniel Wadsworth...."), the State House's spaces, and what took place there. Their occasional reenactments of pivotal events, such as the trial following the 1839 *Amistad* mutiny, draw enthusiastic audiences.

### Bulfinch or Anonymous?

It is by no means certain who designed the Old State House in the first place. Although it has commonly been attributed to the revered Charles Bulfinch of Boston, definitive evidence is lacking. Bulfinch evidently submitted a "mail order" design, as Cummings puts it, but it has been lost, and many features seem to have been reconsidered during construction. The "marble edifice" initially promised by local politicians was quickly transformed into brick and brownstone as the legislature considered appropriations, and each step in the slow-moving construction process was scrutinized. In the 1820s, when the exterior walls were to be capped with a balustrade—a conventional feature at the time—it had be justified as a safety measure for firefighters on the roof. By 1827, when the central cupola was put in place, it was modeled after the one on Mangin and McComb's then recently completed New York City Hall. Nobody knows what Bulfinch proposed.

As originally built, the structure had an open central passage at the first floor, which was enclosed in various ways in later years. In the current restoration, facsimiles of the brick walls that went up in the 1920 renovation have replaced the storefront-type glazing of 1970. The windows and the wood trim are vintage 1920; the originals, which had been put in storage, were reinstalled.

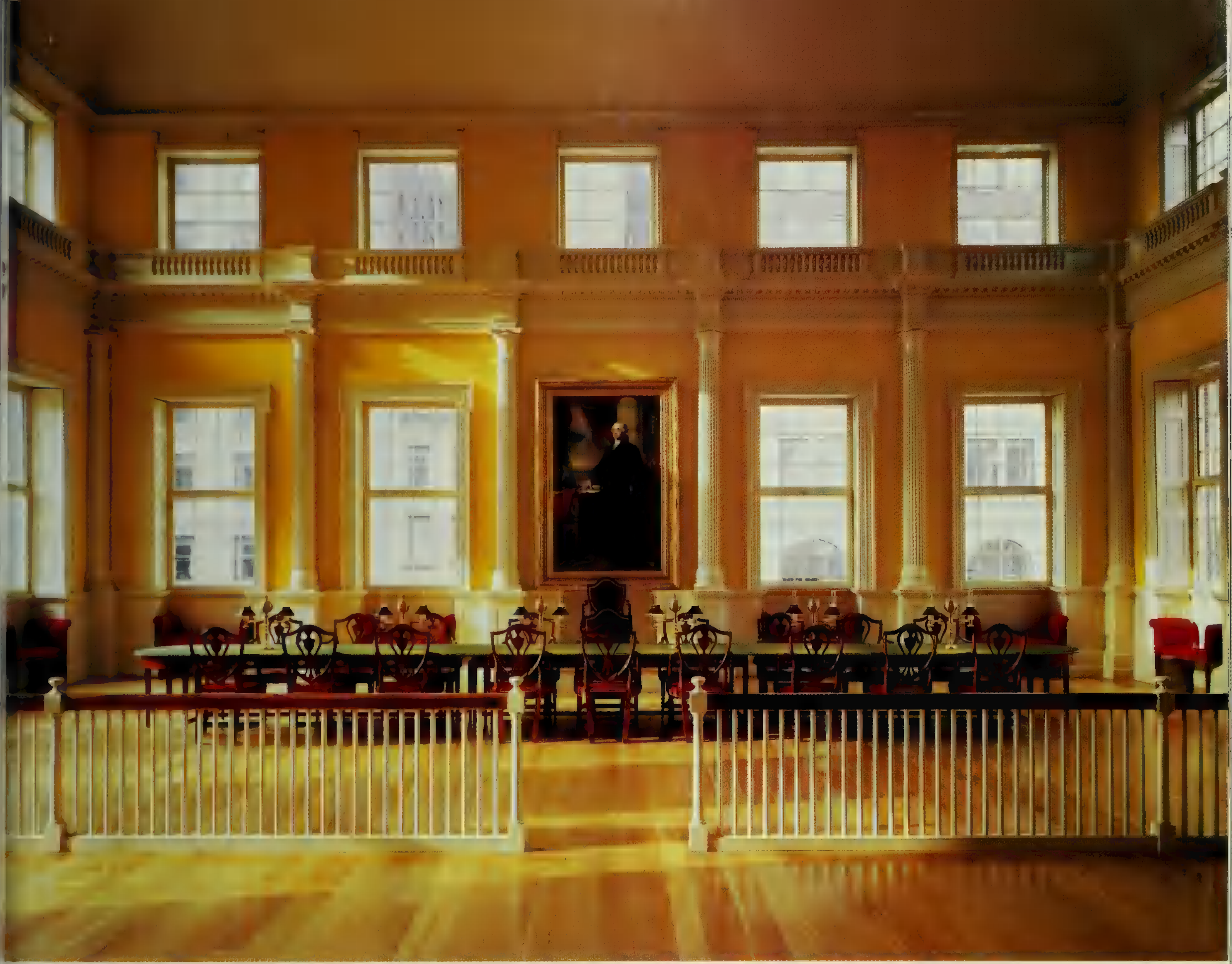
### A procession of periods

The only meeting room returned to its original form, the Senate Chamber, now represents the year 1818. Some of its furnishings were still on hand, though its central table and lamps had to be reconstructed based on indirect evidence. The room's vivid-yellow wall color was a surprise finding of the research and confirms the 18th-century taste for bold colors that has been revealed in other recent preservation efforts. After an effort to duplicate the color in modern paint resulted in a disturbing gaudiness, a re-creation of the distemper coating, using the original chrome-yellow pigment, yielded a richer effect and won the client's approval.

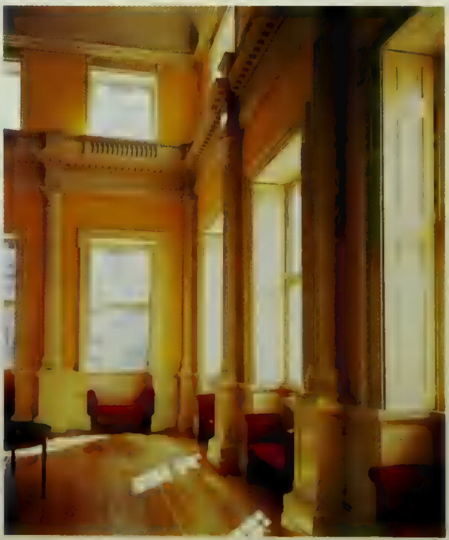
The original House Chamber had been radically altered in the 1870s for its new function as the City Council Chamber, which it was used for until 1915, when Hartford built an elegant Beaux Arts city hall. Good photographic records from the City Council period—and little documentation of its earlier configuration—supported the restoration of this chamber to its late-Victorian condition.

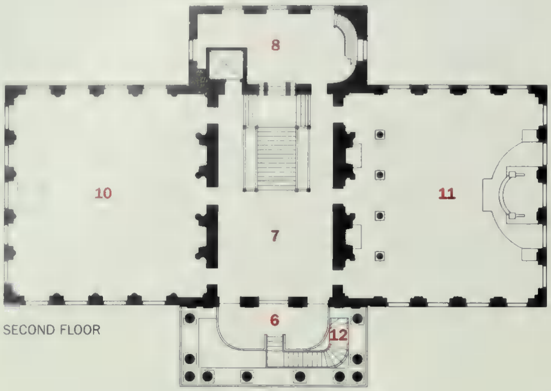
The one large room on the first floor, once used as the State Supreme Court, had been rather grandly remodeled in Georgian Revival mode in 1920. The insertion of several nonstructural Roman Doric columns modeled after those in Bulfinch's Boston State House gave the room a stronger link to its purported original architect. Since little is now known of the room's earlier appearance, it has been preserved as an early-20th-century celebration of the Revolutionary period. Across the first-floor lobby from the Supreme Court, changing exhibit galleries occupy an area that had always been carved up into offices.

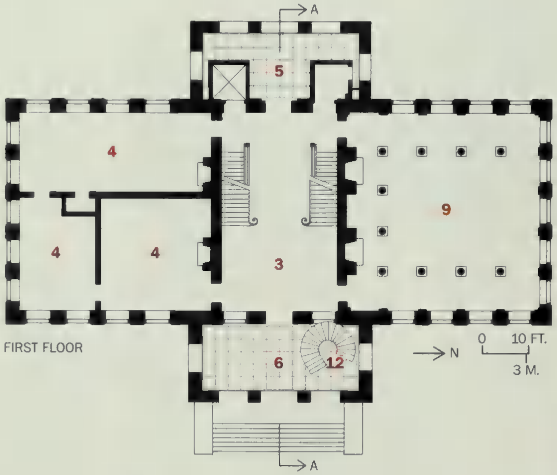
A major component of the project was the construction of a 7,300-square-foot underground exhibition gallery beneath the building's west plaza, accessible from the basement lobby. Unfortunately, the



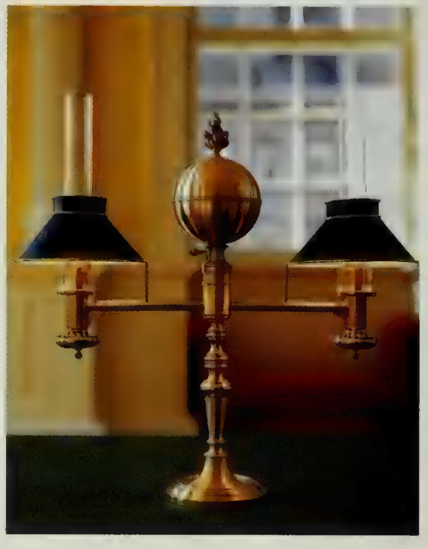
The Senate Chamber, the one room with original detail intact, has walls refinished with a "distemper," identified through paint-sample research. The acanthus leaves on the Corinthian columns were added in 1920, then stripped away in a 1970 restoration. A few of the chairs and benches are original; others are 1950s reproductions. The central table made at that time was later judged a historical misinterpretation and replaced by one that conforms to documentary evidence.

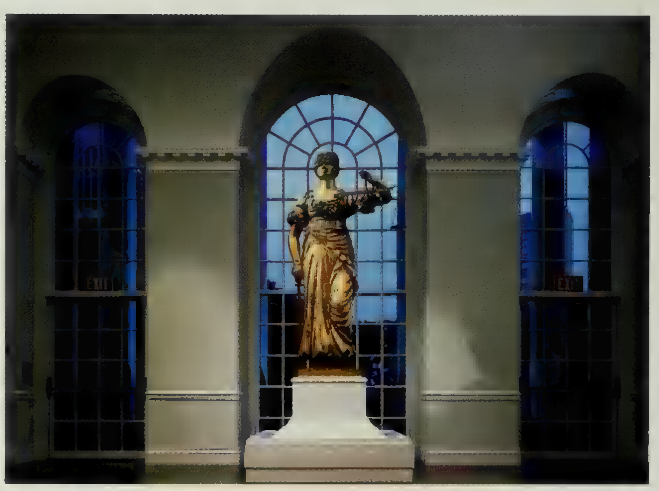


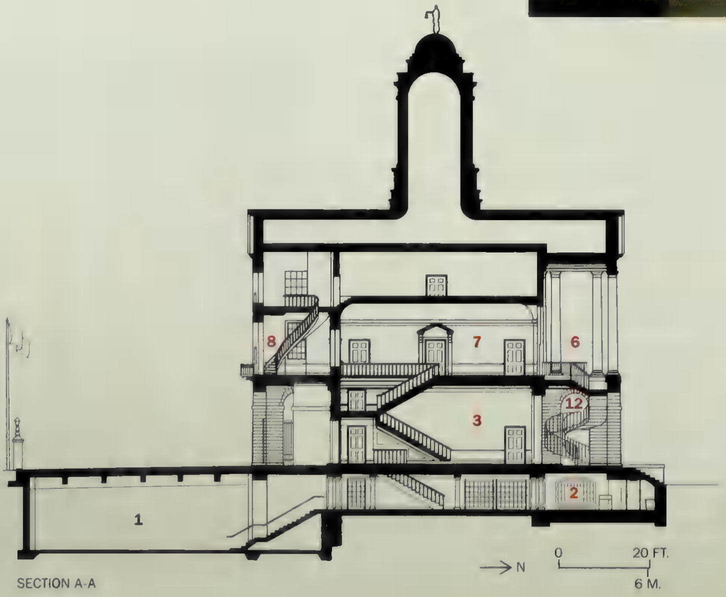




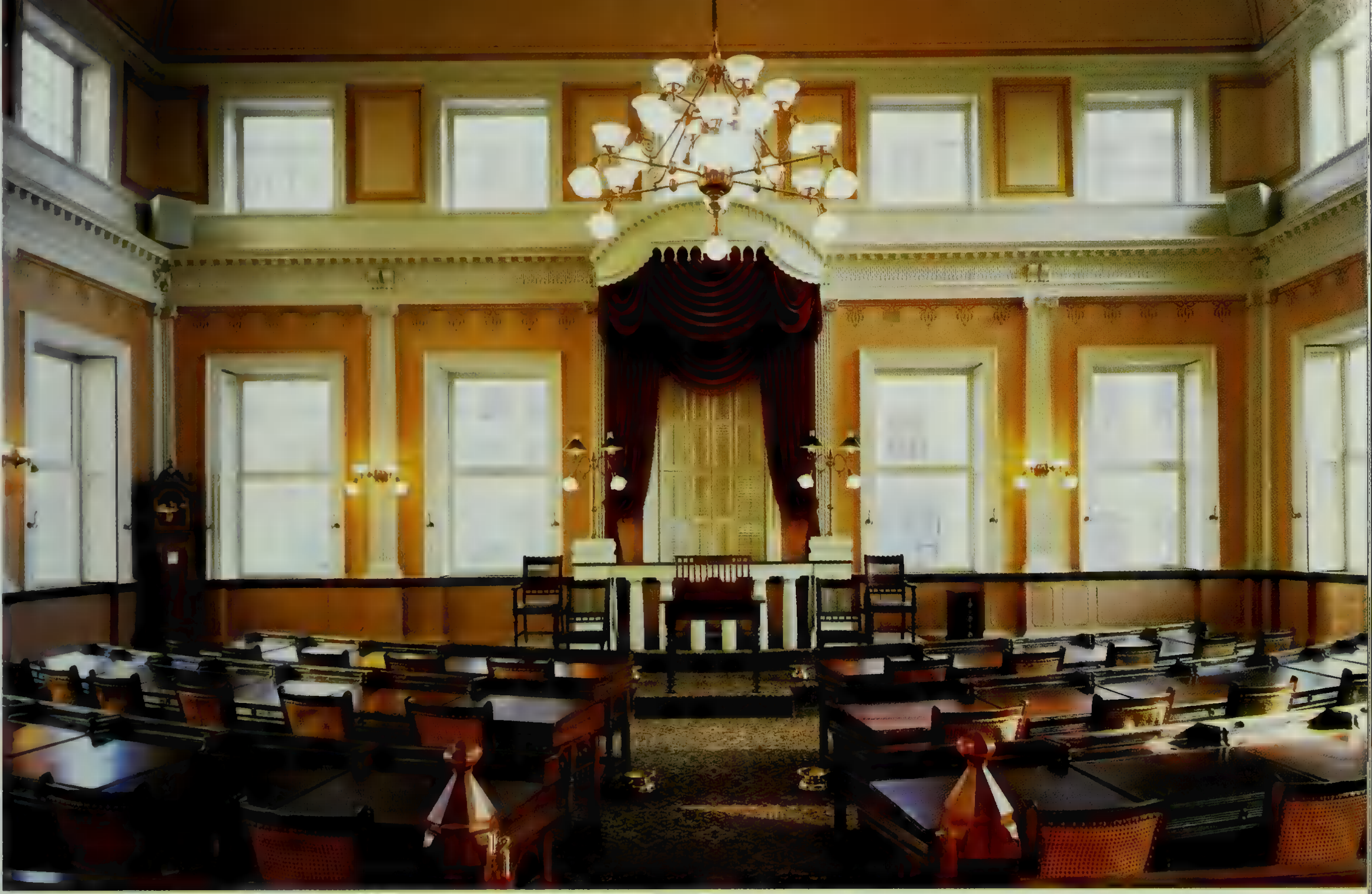
1. *New underground gallery*
2. *New entrance hall*
3. *Great Hall*
4. *Exhibits*
5. *West portico*
6. *East portico*
7. *Great Hall*
8. *Stewart's Museum*
9. *Supreme Court*
10. *Senate Chamber*
11. *City Council Chamber*
12. *New stairs*







**Task lighting (top) in the Senate Chamber was upgraded in the early 1800s with Argand lamps, the halogens of their day. The architects based the design of new Argand lamps on surviving examples and period ads. The gold-leafed wooden statue of Justice, mounted on top of the cupola in 1828 and removed in 1970, is now on display on the second floor.**



Connecticut Historical Society, which is to move its exhibits on state history here from its present suburban location, has not yet done so, leaving this costly space unused.

The vicissitudes endured by the exterior of the building were comparable to those suffered by the interior. The brick walls were originally coated with a "rosy-colored" wash, later painted white, then exposed for the first time in 1920, when red brick fit the popular image of Revolutionary period design. This time the brick has been left exposed, maintaining the look familiar to the project's supporters. The wood trim, painted a historically correct ivory in the 1920 restoration, was repainted bright white in the 1940s. Returning it to a creamy shade was a decision in which research prevailed over popular sentiment.

### Bringing the 18th century into the 21st

Even though the structure's original wood-framed floors had been replaced in the 1920s with a fireproof system (terra-cotta jack arches carried on steel beams), current codes for public assembly required steel reinforcement. And adding the underground gallery necessitated extensive underpinning of the foundations. One major, building-friendly decision was not to conform to the American Museum Association guidelines on climate control, even at the risk of missing out on some potential museum pieces. The interior humidity the AMA requires during the winter, Edwards maintains, would destroy the fabric of such a building, which was constructed with no vapor barriers. For the less demanding air-conditioning standards adopted, the ducts installed in the 1970s proved adequate, although new mechanical equipment has been installed.

Individual and corporate contributions, plus state bond moneys, covered most of the $8.5 million construction cost. An additional $3.5 million in federal grants made it possible to restore interior finishes and furnishings.

Association director Faude is particularly proud of the architects' adherence to ADA guidelines without creating a separate entryway for the handicapped. A new elevator, installed where it impinges on no historic rooms, serves all levels—from the basement gallery and lobby to a new storage facility in the original attic. One unconventional design strategy was to have Main Street, which runs along the building's western facade, regraded so that the principal public entry would have no steps. Making public buildings available for everyone to enjoy, including the elderly and the physically challenged, should be one of the main goals in saving landmarks, says Faude.

Restoring a building to more than one period is a good way to demonstrate what civic buildings meant in different eras and how the public's commitment to construction and renovation ebbs and flows. Visitors may even relish the irony—recurring all over the world today—that so many landmarks originally built on the cheap are now accorded well-funded, technologically sophisticated preservation efforts. ■

**Sources**

**Tables:** *Arnstein/Van Beckum*

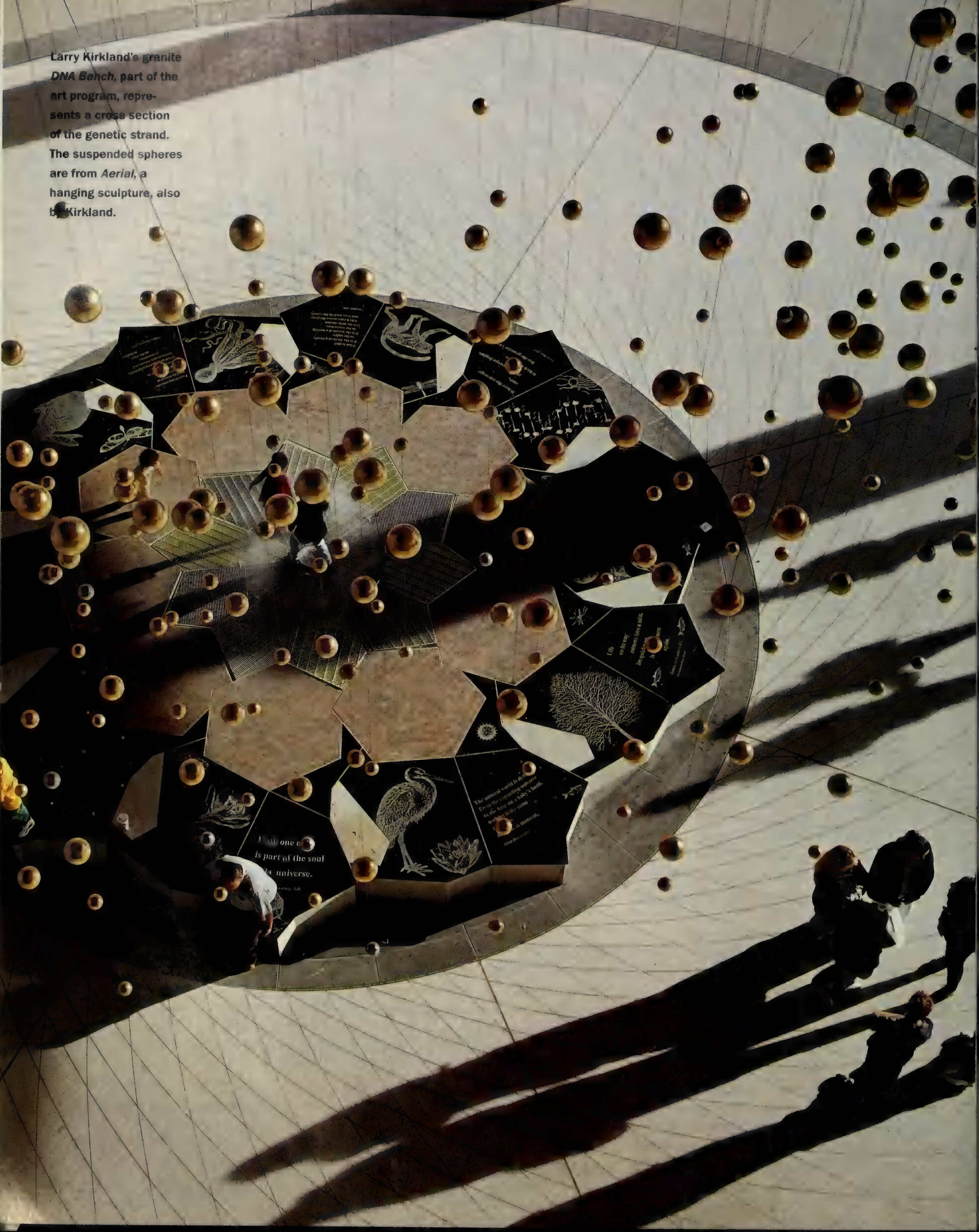
**Upholstery fabrics:** *Scalamandre*

**Reproduction task lighting:** *Hugo Ramirez*

**Elevators:** *Otis Elevator*

**Exterior cast-iron reproductions:** *Cassidy Brothers Forge*

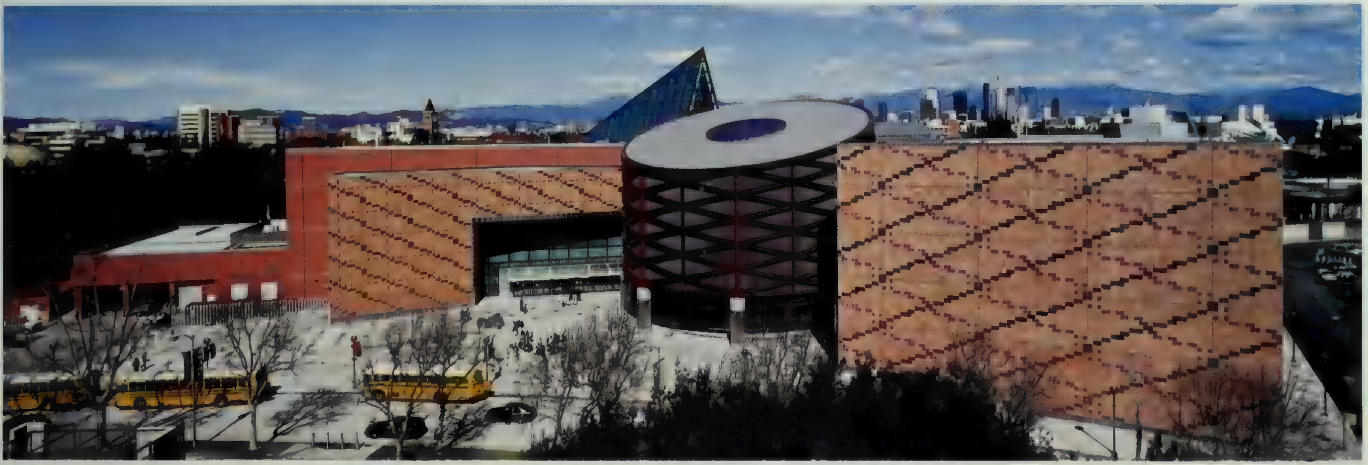
**Historic decorative painting:** *John Canning & Company*



Larry Kirkland's granite *DNA Bench*, part of the art program, represents a cross section of the genetic strand. The suspended spheres are from *Aerial*, a hanging sculpture, also by Kirkland.

# A major redevelopment of the formerly dilapidated CALIFORNIA SCIENCE CENTER brings new energy to the institution and to 120-year-old Exposition Park.

**by Karen D. Stein**



**The giant rotunda is intended as a sheltered gathering space for groups. It connects the museum (left) and IMAX theater (right).**

The centerpiece of Los Angeles's 160-acre Exposition Park is a sunken, seven-acre crisscross of formal pathways and well-tended flower beds called the Rose Garden. Surrounding it on three sides are the civic facilities intended to give life and meaning to this urban park: the Los Angeles County Natural History Museum, the California Aerospace Museum with adjacent armory, and the newly remade California Science Center, formerly known as the California Museum of Science and Industry. The Science Center has 245,000 square feet of brand new exhibition, retail, and restaurant space by the Los Angeles office of Zimmer Gunsul Frasca (ZGF). Nearly halfway through a two-decade-long, $300 million redevelopment that includes two additional wings, the building has been drawing record attendance since it opened last February—up to 15,000 people a day. As for the other institutions around the Rose Garden, the rambling 85-year-old Natural History Museum currently needs renovation. The Aerospace Museum, which was designed by Frank O. Gehry and Associates in time for the 1984 Summer Olympics [RECORD, January 1985, page 114], is soon to share its side of the garden with a school designed by Morphosis.

Located between two disparate worlds—the worn-out fringe of

**Project:** *California Science Center, Exposition Park, Los Angeles*

**Owner:** *State of California/California Science Center—Jeffrey Rudolph, executive director*

**Architect:** *Zimmer Gunsul Frasca Partnership—R. Doss Mabe, AIA, partner-in-charge; Robert J. Frasca, FAIA, design partner; Brooks Gunsul, FAIA, technical partner; Joseph Collins, AIA, project manager; Paul Engels, AIA, John Thompson, AIA, senior designers; Sharron Van Der Meulen, Susan Kerns, interior designers; Jan Willemse, Jeffrey Daiker, AIA, senior project architects; Lisa Fay Matthiessen, AIA, Errki Ojala, AIA, Bob Zimmerman, AIA, project architects; Steve Adams, AIA, Sandra Baik, Julie Cox, AIA, Bob Furusho, AIA, Brian Glover, AIA, Ted Hyman, AIA, Lee Kilbourn, FAIA, Doug Morris, AIA, project team*

**Consulting Architects:** *RAW International; Offenhauser/Mekeel Architects (historical)*

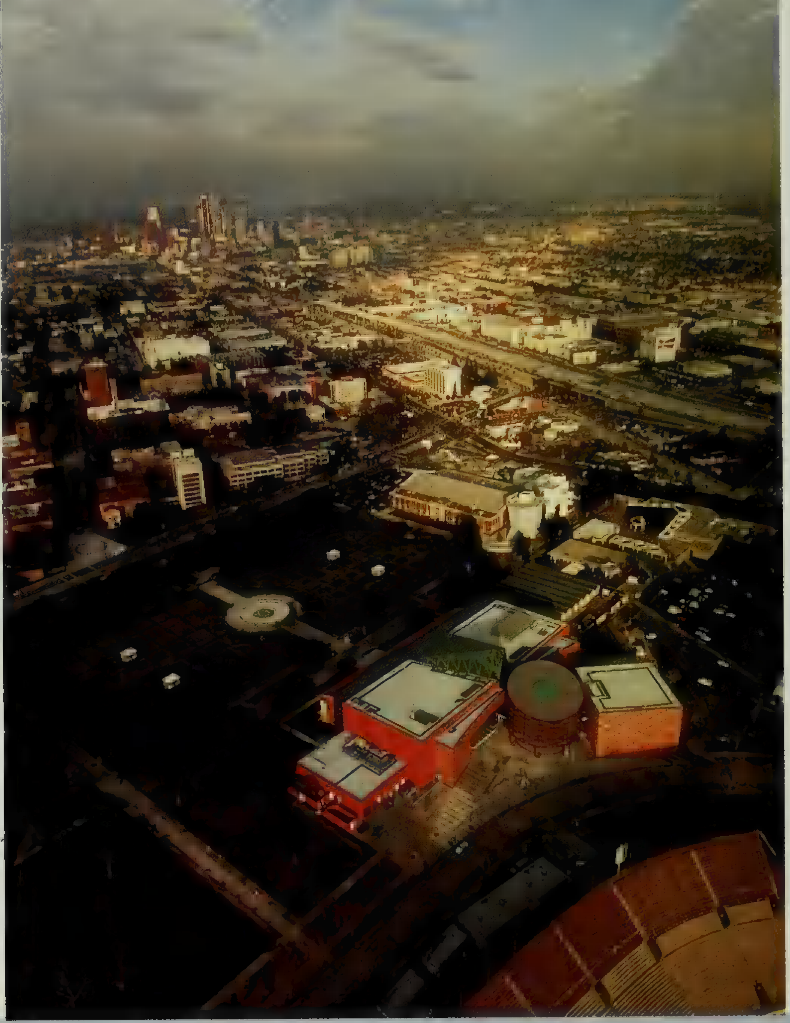
**Consultants:** *West Office Exhibition Design (exhibits); Melendréz & Associates (landscape); Horton-Lees Lighting Design (lighting); Joseph A. Wetzel Associates (exhibit master plan); Donovan & Green (institutional identity); McKay Conant Brook (acoustical); Debra Nichols Design (graphics); Hoberman Associates, Larry Kirkland Studio (artists)*

**Engineers:** *Englekirk & Sabol (structural); Tsuchiyama & Kaino (mechanical); Enteg, Inc. (electrical); CDC (curtain wall); Psomas & Associates (civil)*

**General Contractor:** *Keller Construction Co.*

**Construction Manager:** *Turner/Vanier CM*

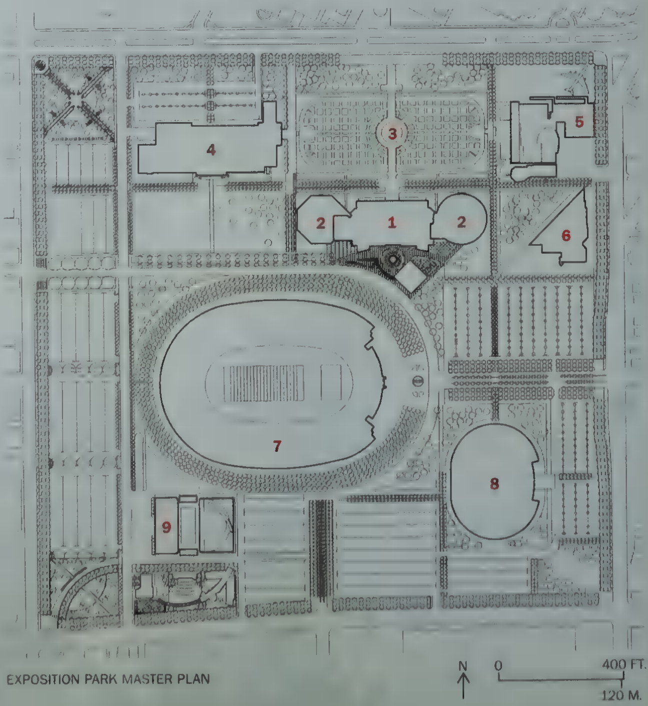
**The center of the historic Ahmanson facade was rebuilt with salvaged brick (top) and integrated with the new building (above), which restored the north perimeter of the seven-acre 1928 Rose Garden (right).**



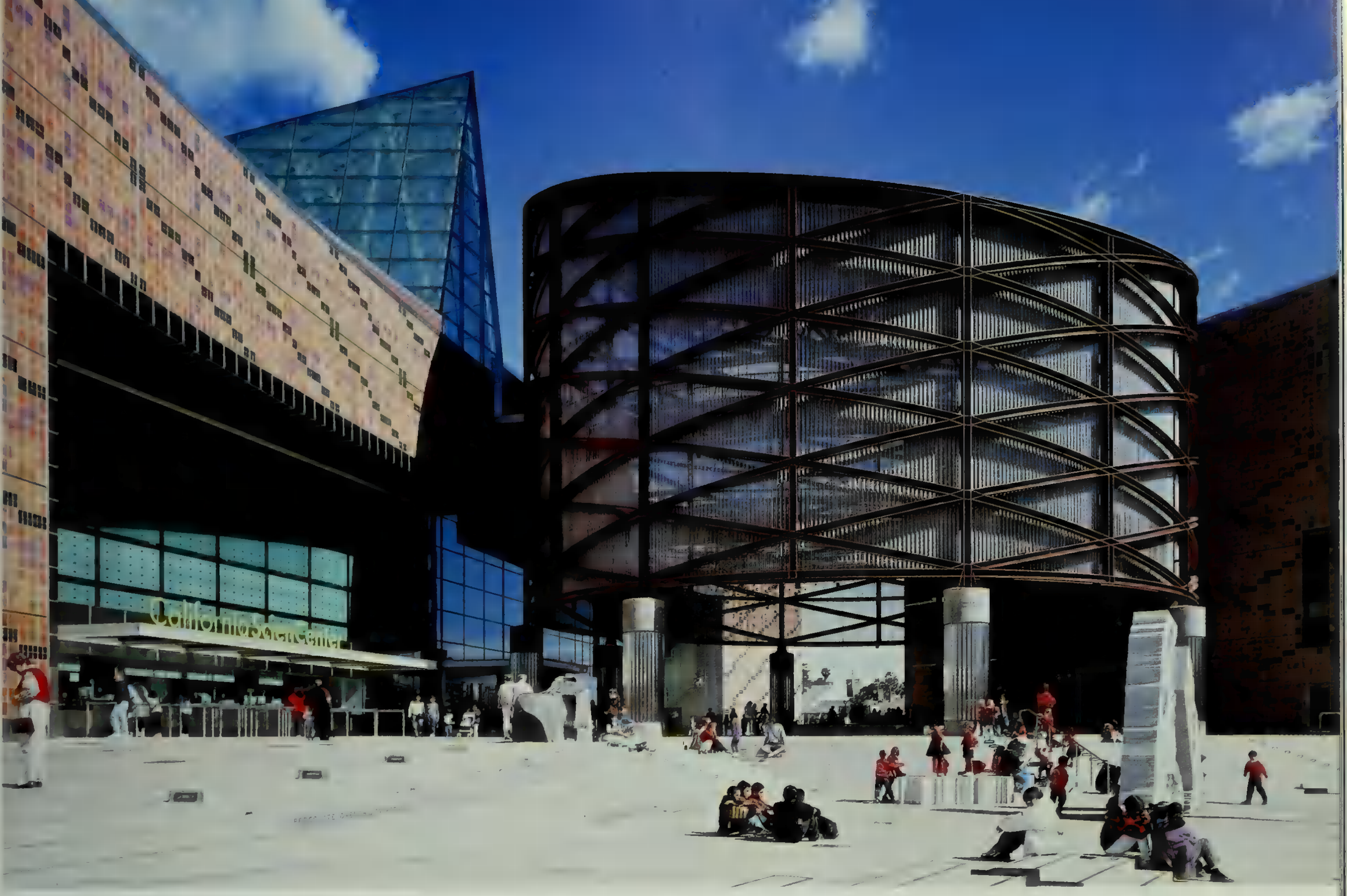
## MASTER PLAN

In April 1991, ZGF was commissioned to produce a master plan for Exposition Park. The results of the firm's planning process, shown at right, assume future changes, including the construction of a Morphosis-designed Science Center School on a site adjacent to Frank O. Gehry's existing California Aerospace Museum, which may be remodeled, and the renovation of the 1932 Olympic Swimming Stadium (currently derelict) into an aquatics center. With the departure of the city's pro football team, the long-term role of the Coliseum is unclear. The ZGF proposal calls for a new tree-lined promenade to encircle the park and the planting of grassy fields to be used for either recreation or parking.

1. *California Science Center*
2. *Future phase of California Science Center*
3. *Rose Garden*
4. *Natural History Museum of Los Angeles*
5. *Science Center School*
6. *African-American Museum*
7. *Los Angeles Memorial Coliseum*
8. *Los Angeles Sports Arena*
9. *Aquatics and Recreation Center*



EXPOSITION PARK MASTER PLAN



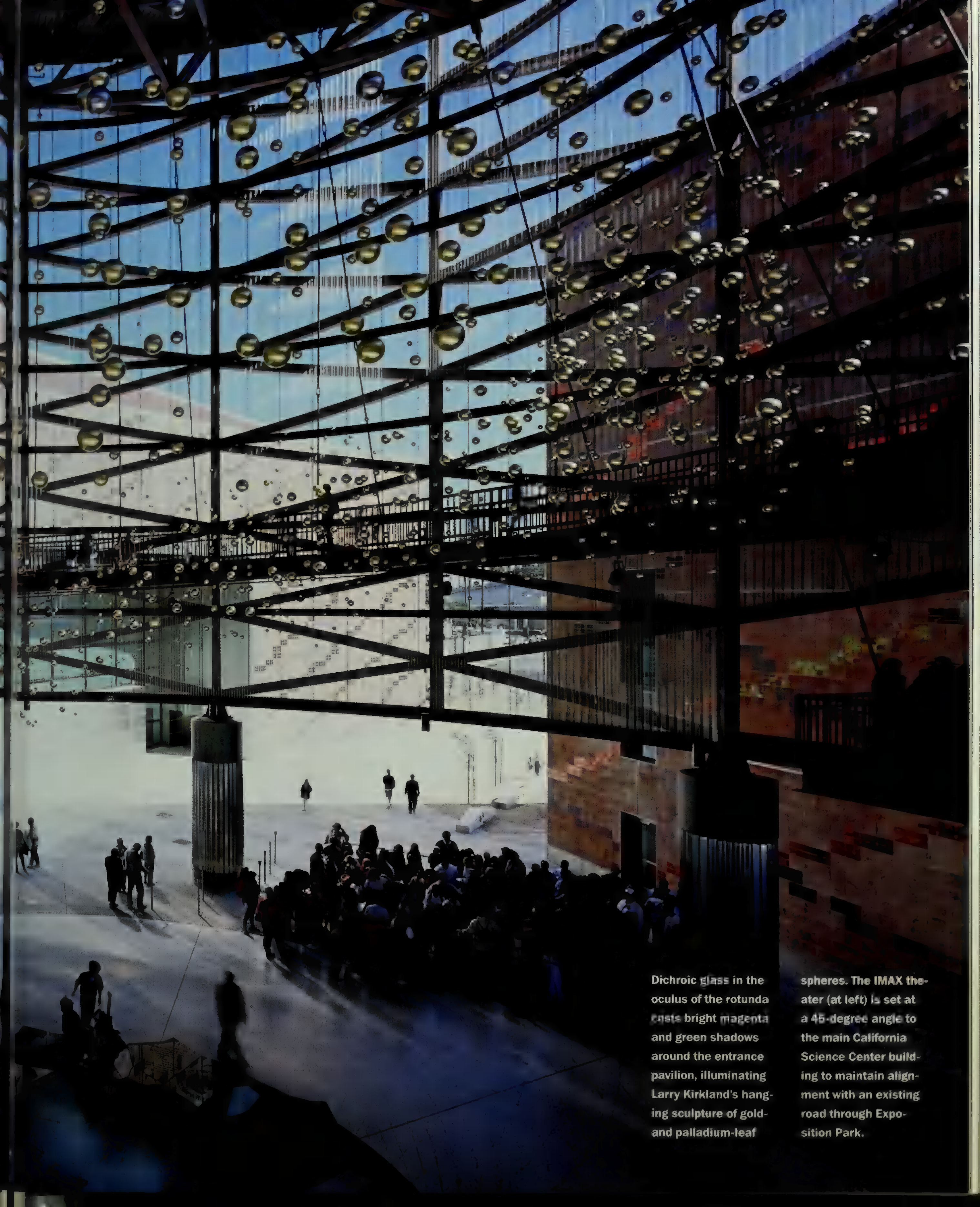
south central Los Angeles, an area made infamous by the 1992 riots following the Rodney King verdict, and the historic core of the University of Southern California campus—Exposition Park has sought to reconcile conflicting constituencies and demands since it opened in the 1870s. Originally intended for agricultural displays, it has been shaped as much by economics as by changing notions of the role of public parks. Debt forced its management association to sell off small parcels in the 1880s, and, following the turn of the century, the area experienced a gradual transformation from a place of contemplation and urban refuge to a center of activity. This shift resulted in the construction of a string of crowd-pleasers: a 75,000-seat sports stadium, the Los Angeles Memorial Coliseum, in 1923; a swimming stadium for the 1932 Los Angeles Olympic Games; and a basketball arena in 1959. While development brought more people to the park, the sports facilities and attendant parking lots guaranteed an erosion of its primary resource: open space.

In 1992 ZGF was in the midst of putting together a regreening proposal for the entire park, a master plan commission awarded to the firm in April 1991, when the California Museum of Science and Industry (CMSI), the park's largest landholder, hired the firm to design its new building. The institution had already been forced to close two of its existing structures because of inadequate earthquake-safety protection. Provided with $47 million of State of California earthquake bond money earmarked for the repair or replacement of deficient structures, client and architect embarked on a public-private partnership that included not only the various institutions within the park but also representatives of the state, the county of Los Angeles, the community, and local preservation groups, which were adamant about maintaining significant portions of the CMSI's historic structures. To pay for the interior, CMSI initiated an ambitious capital campaign, ultimately raising some $120 million from a combination of public and private sources, several million dollars more than anticipated.

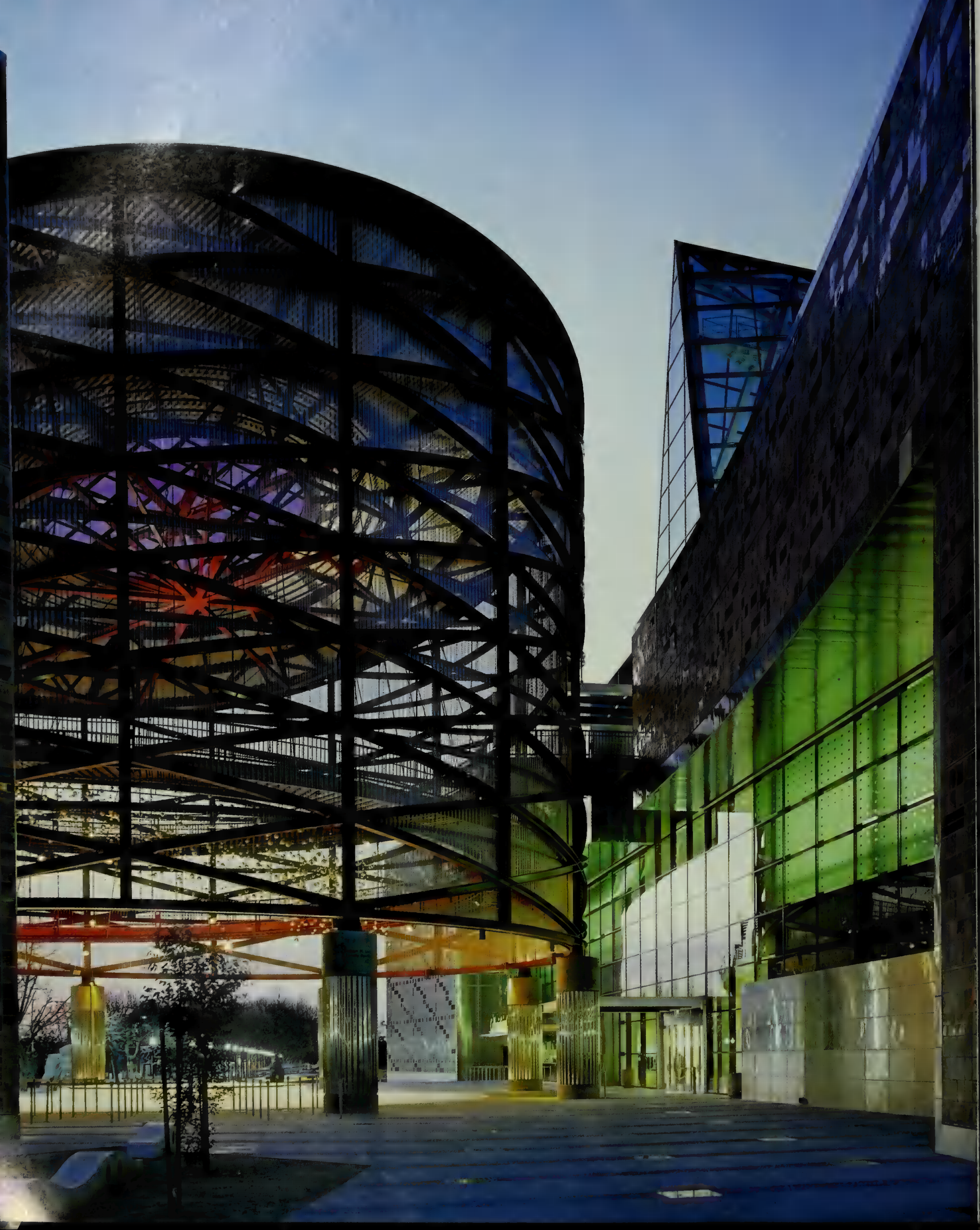
In its design of the California Science Center *(text continues)*

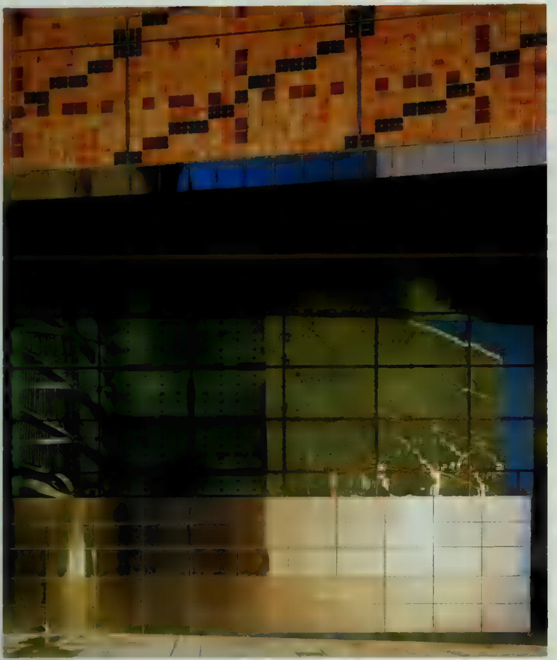
**Accents in the terra-cotta and cementitious tile surfaces have a custom copper or orchid glaze and are meant to "change the scale of such big walls," according to architect Doss Mabe.**

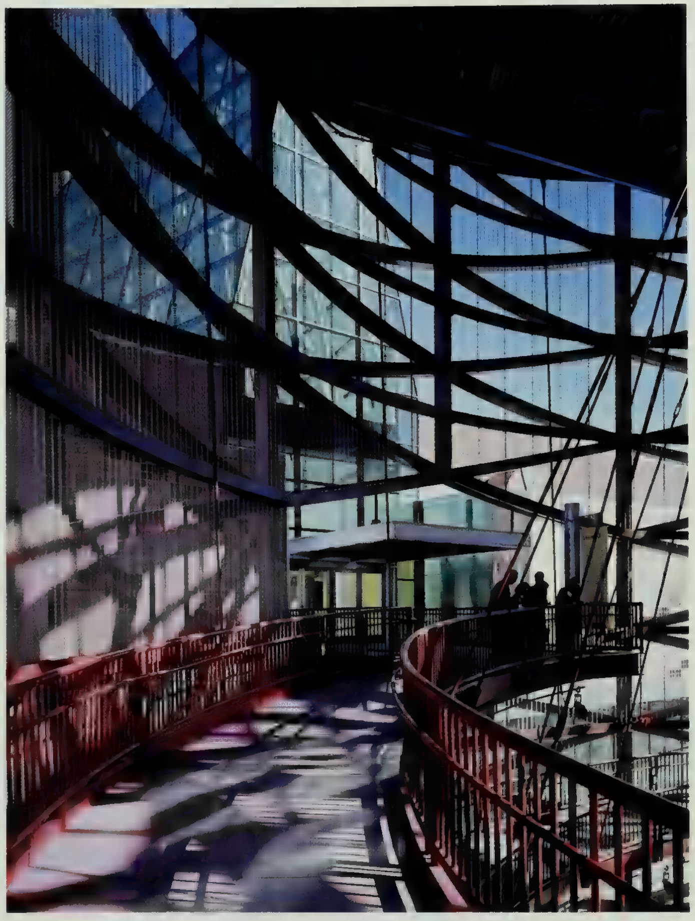
**LOCATED BETWEEN TWO DISPARATE WORLDS, EXPOSITION PARK HAS SOUGHT TO RECONCILE CONFLICTING DEMANDS SINCE IT OPENED IN THE 1870S.**



Dichroic glass in the oculus of the rotunda casts bright magenta and green shadows around the entrance pavilion, illuminating Larry Kirkland's hanging sculpture of gold- and palladium-leaf spheres. The IMAX theater (at left) is set at a 45-degree angle to the main California Science Center building to maintain alignment with an existing road through Exposition Park.







**The open-air drum of the central rotunda is 100 feet in diameter and 88 feet high. Its steel exoskeleton is clad in panels of perforated stainless steel (opposite). Ramps attached to the inside of the rotunda (right) provide upper-floor connections between the IMAX theater and the exhibition spaces in the main building (above).**

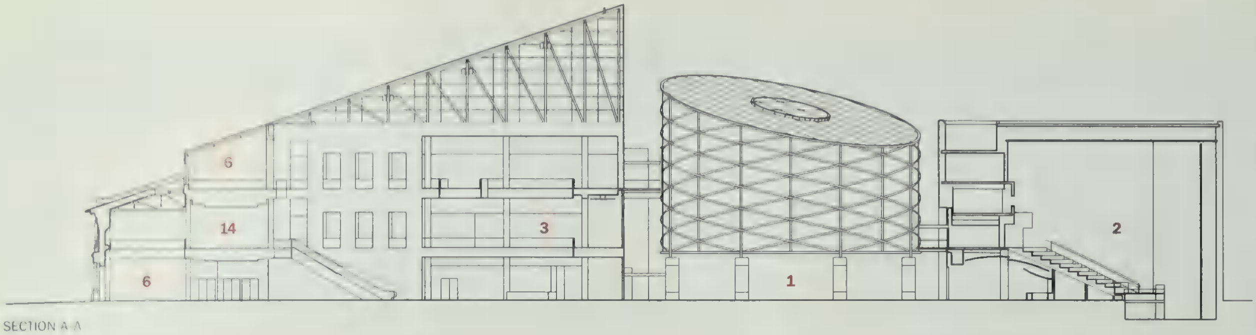
ZGF sought to accommodate all the seemingly conflicting demands of this heterogeneous client group in one design that would "envelop you in science from the minute you entered the space," according to the charge outlined by deputy director Ann Muscat and her colleagues. "We wanted the building to be an easy read for our visitors, so that it would be simple for them to figure out where they need to go. We wanted a building that would capture visitors' imaginations—grab their hearts—then we'd go after their minds."

> **"WE WANTED THE BUILDING TO BE AN EASY READ FOR OUR VISITORS, SO THAT IT WOULD BE SIMPLE FOR THEM TO FIGURE OUT WHERE THEY NEED TO GO."**

For architect Robert Frasca, ZGF's design partner in charge of the project, an appropriate solution for the building was, like the process of defining an appropriate identity for the park, evolutionary. "We were packing everything in and it looked like Nordstrom's," recalls the Portland, Oregon–based architect in describing the early design solutions. "Then [partner] Doss [Mabe] and I came down to the site and we started to think about how to unpack the pieces. We knew we needed an icon and we knew we needed to respond to the symmetry of the Rose Garden. Also, we thought it was important to have a collection space, where kids could gather before they were ready to go inside. In Southern California it's possible for that to be a semi-enclosed space."

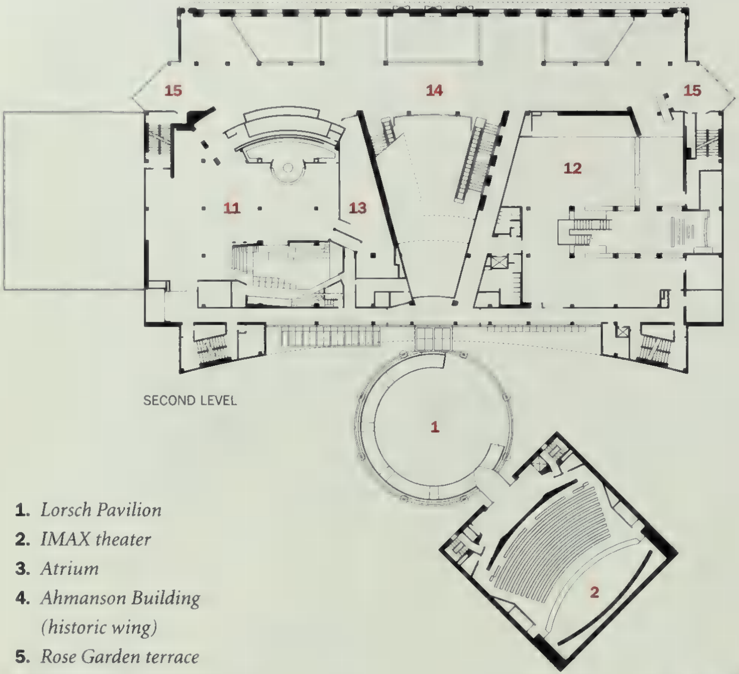
And so out of the dense box they had once envisioned, the architects extracted distinct programmatic pieces, pulling out, most notably, a three-story open-air rotunda as both building symbol and giant front porch. Called the Lorsch Family Pavilion, the space is 100 feet in diameter and 88 feet high. A skylight of dichroic glass casts colored reflections on the ground, on the tile walls, and on *Aerial*, an installation by Washington, D.C.–based artist Larry Kirkland that consists of some 1,600 gold- and palladium-leaf spheres suspended from the ceiling by cables. Beneath the cables, a granite bench, also designed by Kirkland, depicts a cross section of a DNA strand. Together, these parts of the overall art program for the science center are meant to introduce visitors to the major themes of the center: the origins of human life, from the microscopic to the cosmic.

The rotunda was also conceived as an easy, porous link between the exhibition space and the adjacent IMAX theater, with its seven-story-high screen. More difficult was incorporating the remaining north wing of the 1913 Howard F. Ahmanson Building with the new structure. The wing had been engulfed by additions in the 1950s and '60s, and only sections of the original brick and terra-cotta *(text continues)*



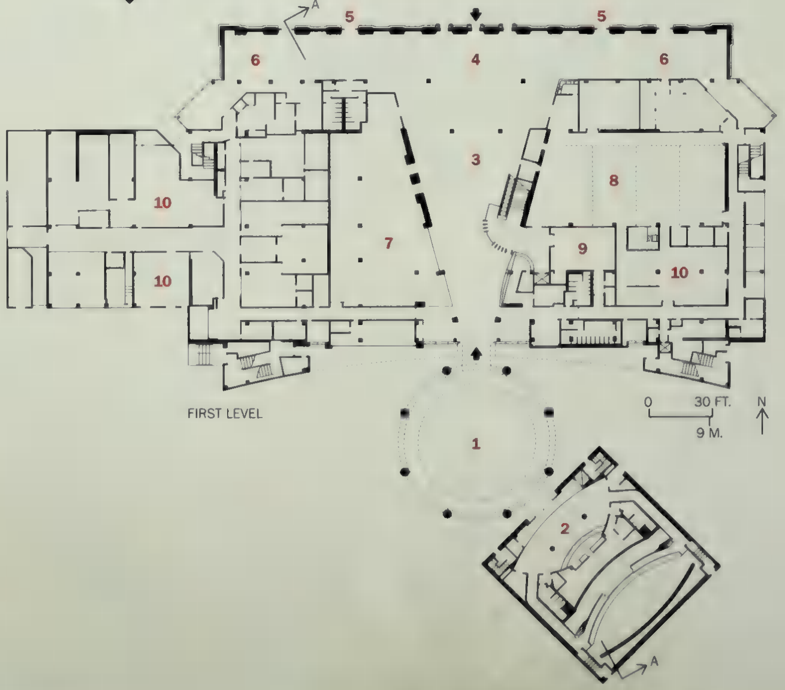
SECTION A-A

At the urging of preservation groups, ZGF incorporated a 1913 wall into the north perimeter of the complex. A giant skylit atrium ties the complex together (section above and photo opposite). Dominating the atrium is *Hypar*, a kinetic sculpture by Chuck Hoberman. Suspended some 40 feet above the floor, the six-sided, 5,000-pound structure is made of over 2,500 aluminum pieces that together expand from 15 to 50 feet.



SECOND LEVEL

1. *Lorsch Pavilion*
2. *IMAX theater*
3. *Atrium*
4. *Ahmanson Building (historic wing)*
5. *Rose Garden terrace*
6. *Dining*
7. *Retail*
8. *Conference center*
9. *Trustee room*
10. *Support*
11. *World of Life exhibits*
12. *Creative World exhibits*
13. *Discovery Room*
14. *Disney Science Court*
15. *Preview of future exhibit*



FIRST LEVEL

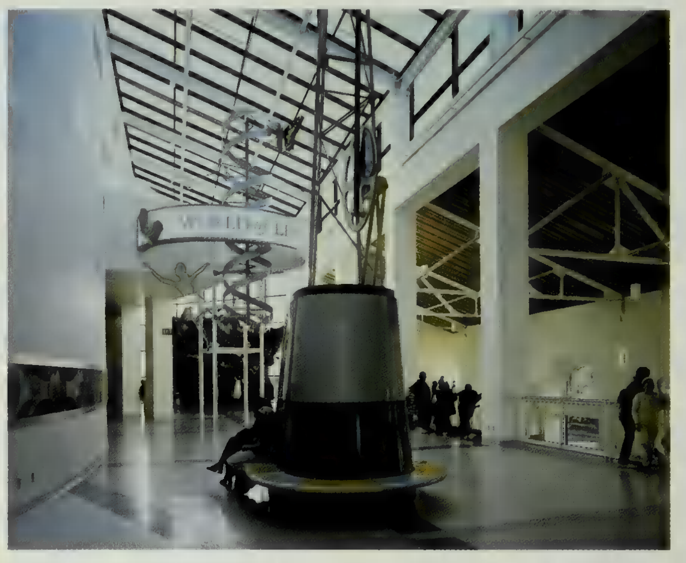
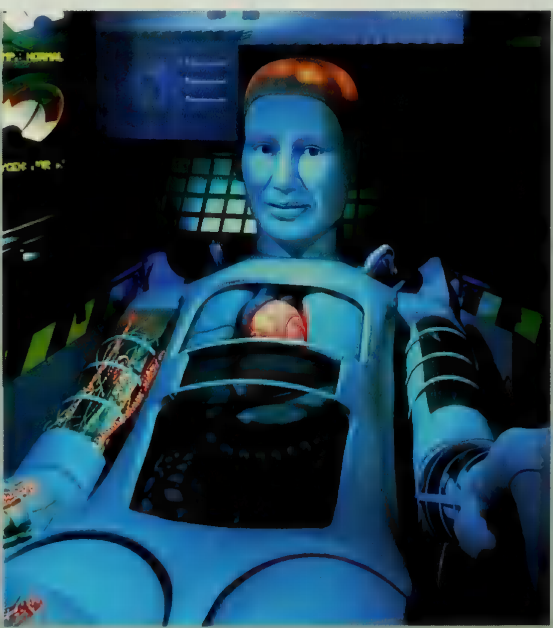
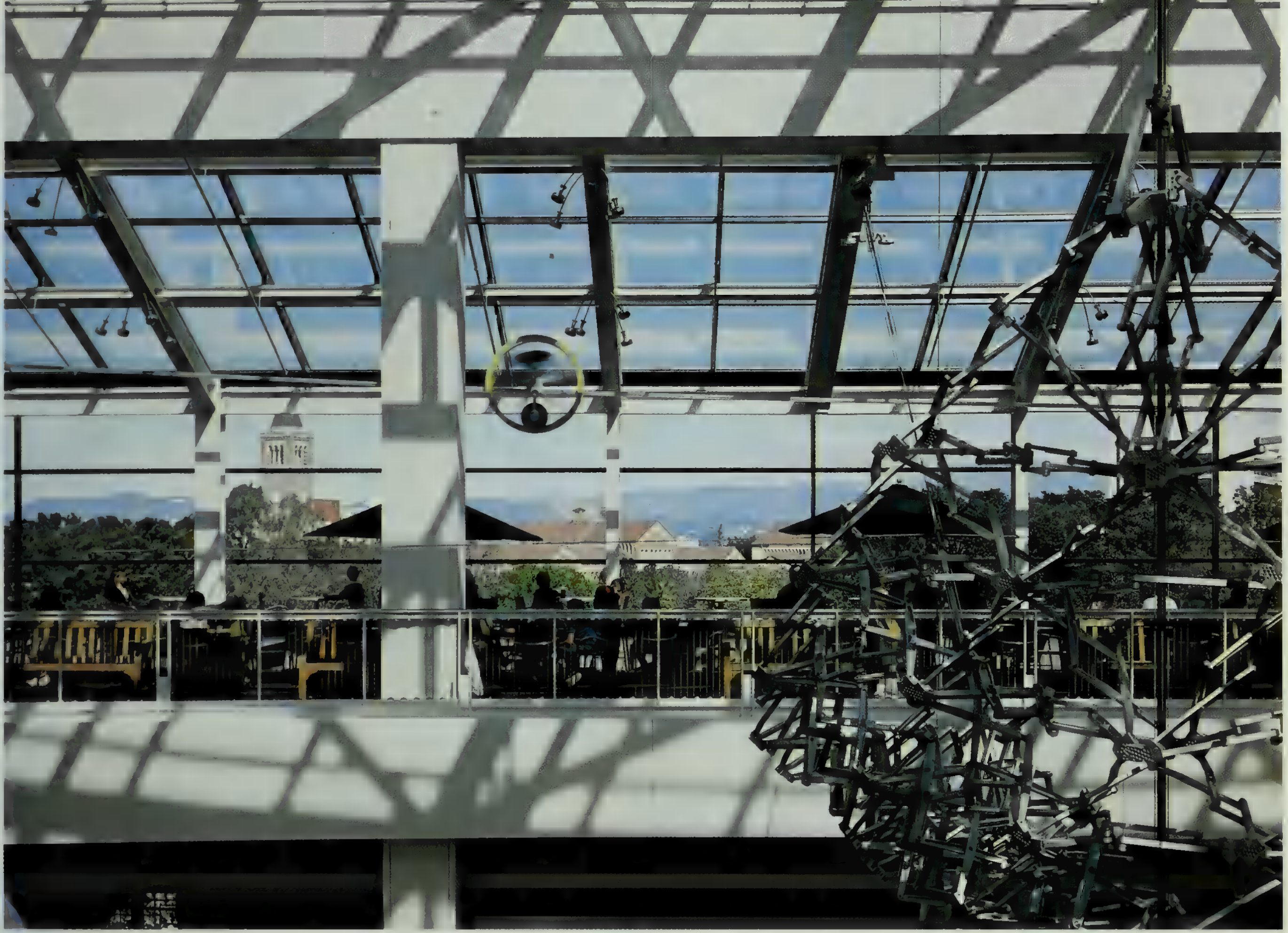


**Exhibit spaces are grouped around the central atrium. Steel trusses, remnants of the 1913 structure, are now purely decorative elements (above). A café overlooks the heart of the USC campus (opposite).**

## EXHIBITS

The California Science Center's exhibition design, by West Office Exhibition Design under the direction of Andrew Kramer and Bill Smith, includes permanent installations gathered in two thematic environments. Creative World "examines the environments humans build to meet their needs for structures, transportation, and communications," according to Science Center officials. Subject matter ranges from computer technology to earthquake-resistant buildings. World of Life explores life from the small scale—the atom—to the large scale—the cosmos. Displays include Survival in California dioramas (below), the BodyWorks Theater (top right), and the Life Tunnel (bottom right). Between the themed environments is a discovery room, intended for parents and small children. It is staffed by volunteers who are participating in a community-outreach program.





facade remained intact. The centerpiece of the facade had to be rebuilt with salvaged bricks. Its design was based on old photographs and drawings—a task that combined archaeology, research, and input from the California Office of Historic Preservation and the Los Angeles Conservancy. "To put this piece back together is very gratifying," explains Mabe. "The Rose Garden is an outdoor room, and this is part of restoring that room." A glass-enclosed lobby with a pyramidal skylight that spans north to south ties the composition of old and new together.

**THE ROTUNDA IS THE SCIENCE CENTER'S ICON AND GIANT PORCH.**

Inside, the enormous lobby gives way on upper floors to loft-like spaces for the various exhibits, which are organized around two themes—World of Life, which explores the processes by which plants, animals, and people survive, and Creative World, which focuses on technologies. Future wings of the Science Center will include the World of the Pacific and Worlds Beyond.

"We try to get away from science factoids," says Muscat, explaining the Science Center's overall agenda. "It's important to create a context that puts people at ease with the subject matter and affects their attitude about science. It makes them more open to learn." Muscat reports that there was some anxiety among her colleagues about how grand the building should be because of its proximity to a poor neighborhood. Area residents dispelled those fears when they expressed a desire for a civic monument of their own. This input bolstered the architects' mission to provide a dramatic public presence for the center. "The institution had been invisible," says Frasca of its previous dilapidated state, "so it needed visibility." And now? "The glass roof can be seen from the freeway," reports Frasca. In Los Angeles, he says with a chuckle, that's high visibility. ■

**Sources**

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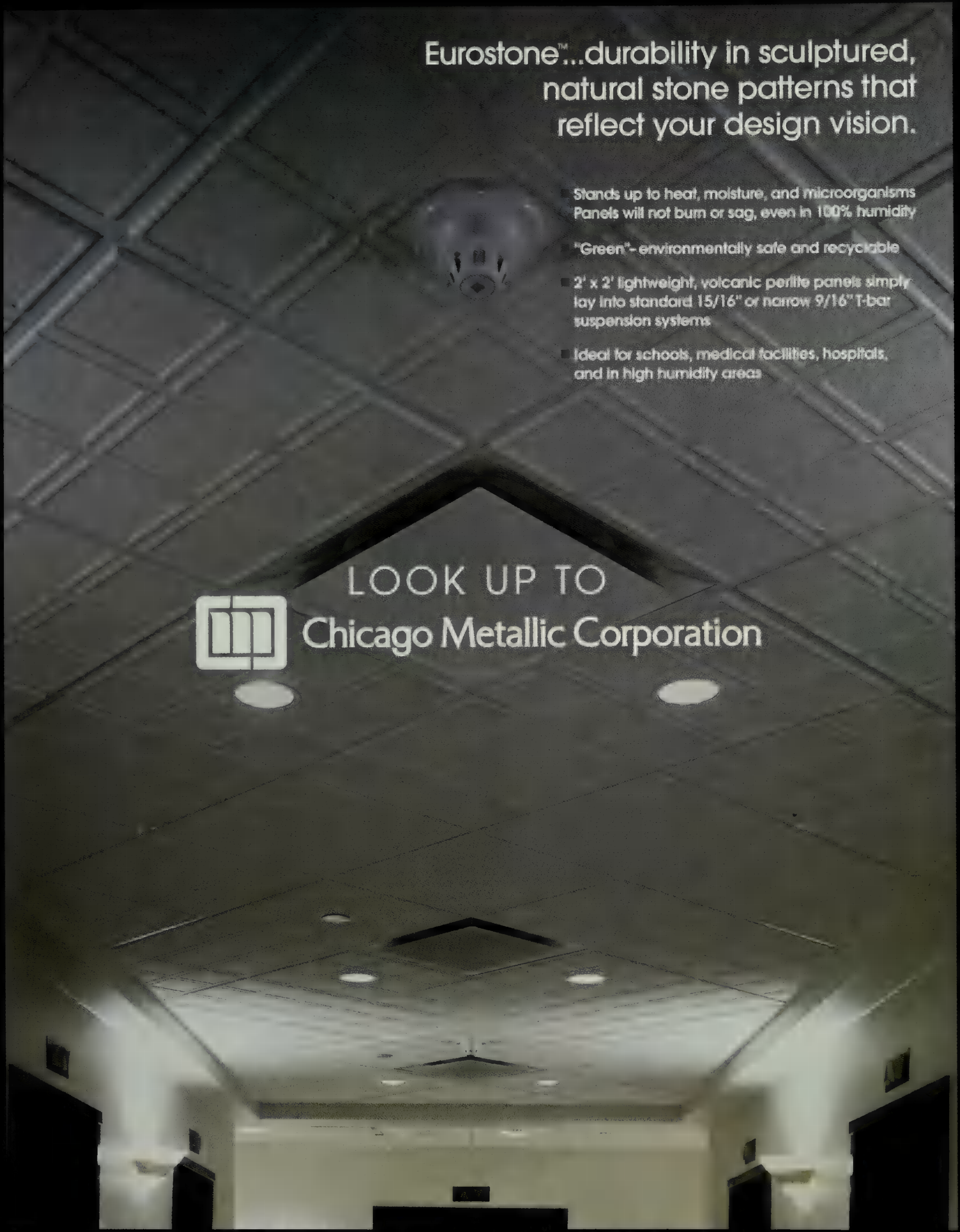Eurostone™...durability in sculptured, natural stone patterns that reflect your design vision.

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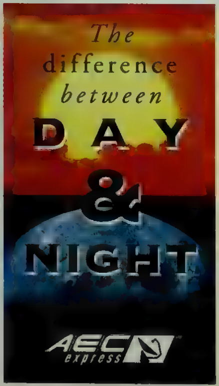

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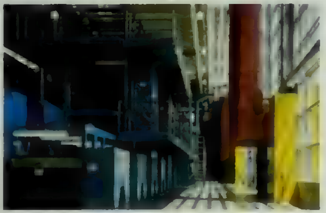
## INDUSTRIAL BUILDINGS

# A New American Factory

### UNGLORIFIED AND UTILITARIAN, THESE AMBITIOUS AND OFTEN INNOVATIVE BUILDINGS ARE THE UNSUNG HEROES OF THE AMERICAN ECONOMIC BASE.

**by Grant Hildebrand**



1

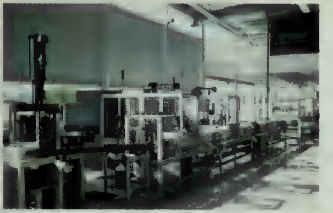
**Flushing, New York**

*The* New York Times *is printed in color now, thanks to the newspaper's new printing facility, designed by Polshek and Partners.*

2

**Tuscaloosa County, Alabama**

*Albert Kahn Associates brings together the best automotive assembly practices of the United States, Germany, and Japan under one roof.*



3

**San Luis Potosi, Mexico**

*Davis Brody & Associates designed a building for an automotive components manufacturer that can be reconfigured for different products with ease.*

*Industrial architecture, often overlooked in the mainstream press, has had a significant impact on the development of other building types, and American designers have been leaders in the field. In recognition of this,* ARCHITECTURAL RECORD *commissioned Grant Hildebrand, a professor of architecture at the University of Washington, to examine the history of industrial buildings. Hildebrand looks with particular emphasis at one American firm that has influenced many others: Albert Kahn Associates.*

The appearance of architectural firms devoted to industrial buildings coincided with a change in the Industrial Revolution itself, a change of such a degree that it might be called a second industrial revolution. In the 19th century the Industrial Revolution represented a shift from home-based industry to production and manufacturing processes focused in a central location: the factory. Most of the early factories were grim places indeed. Little attention was devoted to finding ways to refine the assembly process, and what was lacking in organizational quality was made up for by the sheer volume of labor. At the same time, little thought was devoted to the working environment; no one cared much about whether workers had adequate lighting, comfortable seating, or a safe escape route in case of fire.

The second revolution came at the dawn of the 20th century, when industry began to address the importance of a factory carefully organized to foster maximum output. That affected not only the system by which tasks were assigned to workers and, to a lesser extent, the kinds of conditions in which employees did their work, but also how the production process itself was designed. Factories were no longer collections of laborers going about their individual tasks. Instead they evolved into methodical, systematic assembly operations, with each employee contributing in a specialized way to the manufacture of the product.

Architecture geared to the needs of organized industry emerged during that same period. This architecture became an entity unto itself, finding its own methodology, putting forward its own dramatic innovations. In the end, its emergence would become an international story. But the United States—its industrialists and its architects—played a vanguard role.

*Grant Hildebrand is a professor at the University of Washington's School of Architecture and the author of* Designing for Industry: The Architecture of Albert Kahn *(MIT Press). He is currently writing* Origins of Architectural Pleasure *(University of California Press).*

**The 1922 plate-glass plant at the River Rouge was quick to build (left). The River Rouge site was 2,000 acres (right). Albert Kahn (below).**

No architectural firm had a greater influence on the development of industrial architecture than Albert Kahn's. But there is evidence that the architect's work had a wider influence too, affecting the development of Modernism itself.

Many years ago architectural historian Reyner Banham traced the chain of events behind the design of Walter Gropius's 1911 Faguswerk in Alfeld, Germany, a building that's widely accepted as a cornerstone of Modernism. Faguswerk was partly owned by the United Shoe Machine Company of Beverly, Massachusetts, whose own reinforced-concrete factory of 1903 was the work of Ernest Ransome. Banham claims that in commissioning Gropius to design his building, Fagus put two photos on his desk: one of the Beverly factory and one of the newly opened Ford plant in Highland Park, Michigan, by Albert Kahn. There is evidence for Banham's claim that the clean frame of the Faguswerk building might have been inspired by these two American works, the Ford plant in particular. Furthermore, Gropius would later refer to Fagus as "an American factory."

That American industrial architecture was a source for European Modernism isn't news; it's well known that Gropius, and later Le Corbusier, published photos of American factories and grain silos, and Erich Mendelsohn made pilgrimages to such sites. Banham's research, however, brings some specificity to the story. And it brings Albert Kahn into the picture. However, if the photo Gropius saw was the one shown here (above left), he didn't see the factory's most important feature: the great central assembly hall.

Ford's Highland Park facility was much more than a four-story building. The carmaker intended to use gravity to assist in assembling the Model T, and he called on the building for help. At the center of the structure was a tall, open volume within which subassemblies of the automobile could be dropped one on top of the other—the body could be dropped on top of the chassis, for example. But at that same Highland Park plant, in March 1913, Ford tried building the magneto by moving the increasingly assembled unit past fixed work stations by means of a conveyor belt, or an assembly line. Such a manufacturing concept was best served by a single working floor long enough to contain the elements of the assembly process. This system, in turn, carried two other architectural implications.

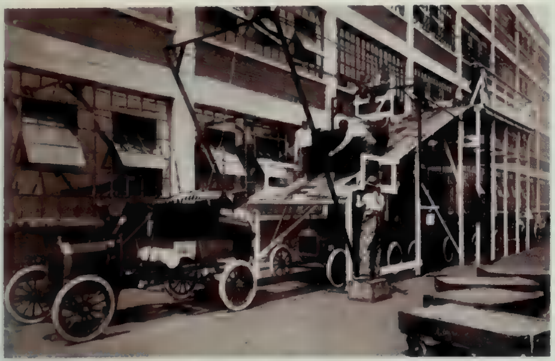
While previous factories had brought in light through wall windows, this wouldn't work in a one-level factory floor with broad dimensions. In 1906 Kahn, in concert with architects Lockwood, Greene and Company, built a single-story, broad-dimensioned factory for the George N. Pierce Company in Buffalo where unusually even lighting was accomplished by glazing the slanted surfaces of a sawtooth-shaped roof. Though the Pierce plant, which came seven years before Ford's experiments at Highland Park, wasn't intended for assembly-line production, it was ideally suited to the process.

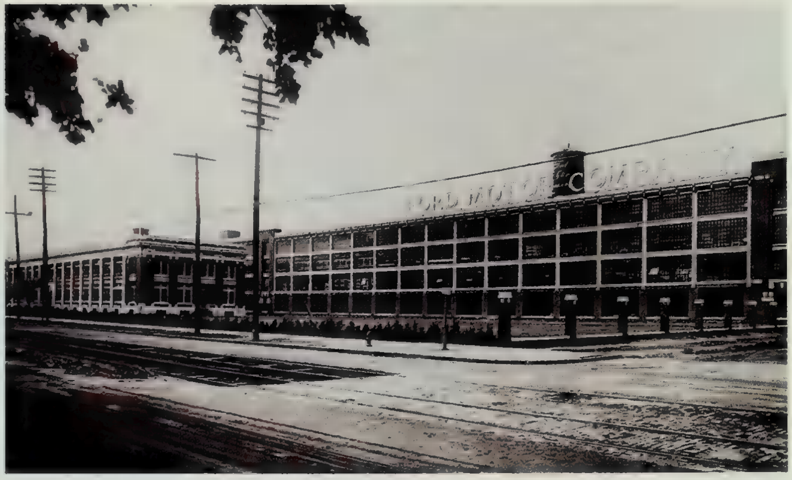
The choice of building material was also driven by the invention of the single-floor assembly line. Concrete had advantages for multistory factories because it was fireproof and its considerable deadweight helped dampen vibrations. But in a one-story factory, equipment could rest on grade, and with no stairs to navigate, the threat of loss of human life by fire was radically reduced. In this type of building, the steel frame made sense, and it brought another advantage: speed of construction.

In 1917 Ford bought 2,000 acres on the River Rouge near Detroit (with a rail connection to Highland Park) to build a new industrial complex. Kahn was to be the primary architect of the buildings, which were to be one-story and steel-framed. The resulting 1922 plate-glass plant at the River Rouge is the epitome of American industrial architecture at the time. The plan is crisp and simple, with an economical footprint. The section is tailored to the various light and ventilation needs of the annealing, grinding, and polishing lines.

The plant was the prototype for the remaining River Rouge facilities and, eventually, for manufacturing buildings in much of the industrialized world. Its progeny at River Rouge alone, all by Kahn's firm, include the pressed steel, spring and upset, and open hearth buildings; the blast furnaces; the rolling mill; the coke ovens; and the power house.

How did this work stand in relation to other industrial architecture of the time? In 1914 Fiat began design of a new factory at Turin [see RECORD, March 1997, page 42]. A five-story version of the Ford plant at Highland Park, its only innovation was the banked, oval test track on the roof. Manufacturing began at grade, with final assembly on the fifth floor, closest to the track, reversing the gravity-assisted design of Highland Park's assembly hall. In the February 1933 issue of the *RIBA Journal*, which focused on industrial architecture, all of the examples cited were multistory, concrete-framed factories—11 years after the River Rouge glass plant. Clearly American industrial design was more advanced than that found in other countries.





Ford used gravity to help assemble the Model T (above) at the Highland Park Ford plant, a model for factories to come (right).

Kahn's later steel-framed factories of the 1930s demonstrate his unusual ability to create an architecture from uncompromised utilitarian demands. The Dodge half-ton truck plant at Warren, Michigan, completed in 1937, is a well-known example: it's crisp and elegant, spare and useful. Milton Brown, in *American Art,* chose a photograph of this building as the frontispiece for his section on American art between the wars.

Brown claims in this book that Mies's industrial style of steel, glass, and brick was anticipated by Albert Kahn Associates. Kahn's various factories of the 1930s, notably those for General Motors and the Chrysler Corporation, exhibit a precision of architectural detail that is remarkable for the period, Brown says, and is surely a source for the Miesian style.

Can Brown's claims be proven? There is some supporting evidence. Mies came to the United States in 1938. In 1939 George Nelson published *The Industrial Architecture of Albert Kahn,* and one of Mies's students, Myron Goldsmith, recalls his teacher poring over the book. Mies's work changed significantly at that time; he turned toward a greater interest in crisp revealed structure and, above all, steel structure.

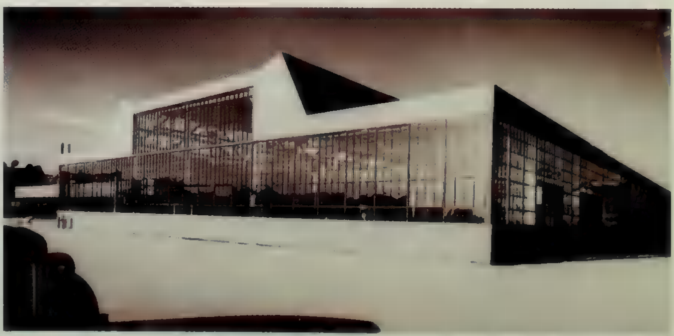
That the Kahn work had something to do with this is further supported by the history of Kahn's 1937 assembly building for Glenn Martin Aircraft, outside Baltimore, an elegant, column-free space. Mies's well-known proposal for a concert hall of 1942 is a collage of wall planes over a photo of Kahn's grand space. Such contemporaneous appropriation of one architect's work by another is rare and it's particularly important in light of how dominant Mies's influence was in American Modernism of the 1940s and 1950s. With the exception of Frank Lloyd Wright, almost every major American architect—including Paul Rudolph, Eero Saarinen, Minoru Yamasaki, Edward Stone—worked in a Miesian idiom. Thus, Kahn's late steel-framed factories may have contributed to the late and utterly pervasive phase of International Modernism, as his early work may have contributed to its early European phase.

Kahn was not alone in this story, of course. In its busiest period his firm designed hundreds of factories outside the United States and fully 19 percent of this country's industrial work. These are impressive numbers. But the obvious corollary is that firms other than Kahn's were designing more than 80 percent of this country's factories. Banham, in *A Concrete Atlantis,* made a case for Lockwood, Greene and Company, not Kahn, as the decisive architects for the Highland Park plant. Banham traced many other concrete industrial buildings by that firm, including striking examples for the Larkin Company of Buffalo (better known for its 1904 administration building by Wright). In later decades, the Austin Company, along with many other firms, played major roles in the development of the one-story, steel-framed factory. Yet Kahn was perhaps the key figure in the story.

Kahn's own death in December 1942 coincided with a change in industrial architecture. The last major factory with which he was involved was the Willow Run bomber plant, south of Detroit. Because of a perceived need to protect the plant from night attack, Willow Run was lit entirely by electrical fixtures, which became standard practice. Other changes have reshaped industrial architecture in the ensuing half-century, most profoundly new technological aids to assembly. These changes are often accommodated through revisions to the existing structure; most of Kahn's buildings of the 1920s and 1930s for Ford still exist.

What of the Kahn firm itself? It carries on a general practice of significant institutional and commercial work. And it continues its involvement with industry, with a clientele that includes names familiar to its founder, and some new clients too.

Is there larger significance to this story? Suppose we imagine a future archaeologist investigating our time. What structures would say the most about this American century? There is Disney World; there is Richard Meier's Getty; there is Henry Bacon's memorial to Lincoln and Maya Lin's to Vietnam veterans; there is Louis Kahn's Phillips Exeter Library; there is the vast treasure of Wright. There are quasi-architectural candidates: the Golden Gate Bridge and the Grand Coulee Dam. But one could also make a strong case for one of our great industrial complexes—perhaps Ford's River Rouge. For the future archaeologist, these might be the most informative of all, the most realistic evidence of who we were and what we did. ■



The crisp design of the 1937 Dodge half-ton truck plant in Warren, Michigan, symbolizes the industrial architecture in the 1930s.

# 1

# New York Times Printing Plant Flushing, New York

### PRINTING THE NEW YORK TIMES IN COLOR REQUIRES HIGH-TECH PRESSES AND A NEW FACILITY WHERE ROBOTS ROAM.

**by Mildred Schmertz**

**Project:** *The New York Times Printing Plant, Flushing, New York*
**Owner:** *The New York Times*
**Design Architect:** *Polshek and Partners Architects—James Stewart Polshek, FAIA, Richard M. Olcott, FAIA, design principals; Joseph L. Fleischer, FAIA, John Walsh, AIA, principals in charge; John Fernandez, David Wallance, AIA, senior designers; Jihyon Kim, AIA, technical designer; Kyle Yang, Lawrence Zeroth, Margaret Kundert, David Bushnell, Min Cho, Thomas Wong, Kevin McClurkan, AIA, Darius Sollohub, AIA, Francelle Lim, project team*
**Architect of Record:** *Parsons Main, Inc.*
**Engineers:** *Parsons Main, Inc. (mechanical, electrical, structural); Harnischfeger Engineers, Inc. (materials handling)*
**Consultants:** *Cline Bettridge Bernstein Lighting Design (lighting); DiDomenico + Partners (landscape); Premier Food Service Equipment Corp. (kitchen); Hertzfeld Design (furniture)*
**General Contractor:** *Lehrer McGovern Bovis*

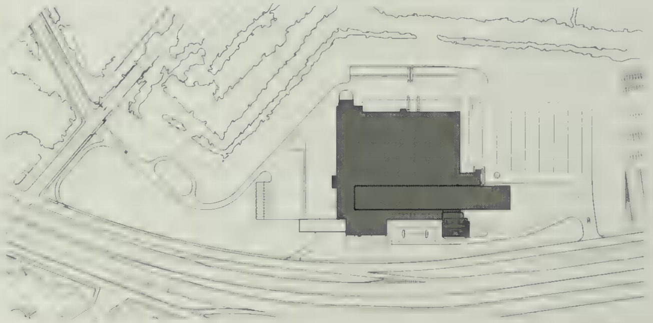
**Size:** *515,000 square feet on two levels*
**Cost:** *$350 million*

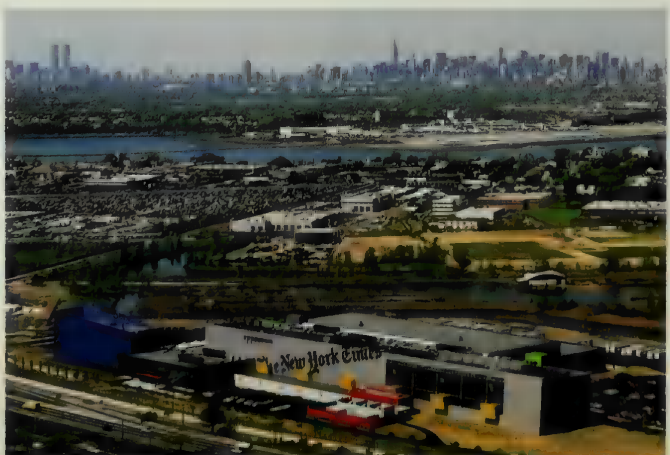
To those readers who are purists, the *New York Times* is not really the *Times* with color splashed all over its revered pages. But thanks, in part, to the five new high-tech presses at the *New York Times'* recently completed $350 million printing plant at College Point, in Flushing, New York, the esteemed international newspaper has joined the ranks of other dailies in producing its pages in color.

The College Point plant is one of ten around the country that print the paper in color. But it is the most technologically advanced of these, thanks to its use of robotics, computerization, and a skillfully arranged production sequence. The production process begins with trucked-in rolls of newsprint and ends with the shipping of the daily editions to newsstands and delivery services in the greater New York City area, Connecticut, and New Jersey. Advance sections of the Sunday *Times* are shipped nationwide—a process that's made simpler by the plant's proximity to LaGuardia Airport.

Located just 50 feet from the edge of the busy, six-lane Whitestone Expressway and just a few miles from LaGuardia, the new plant is designed as a highly visible, eye-catching, three-dimensional billboard. The 515,000-square-foot, three-story structure has a steel skin that's painted in vivid colors that resemble the palettes of Russian Constructivist posters. The familiar *New York Times* logo is emblazoned on the highway side in black-painted steel-mesh letters, leaving motorists with little doubt that this is where the daily newspaper comes from.

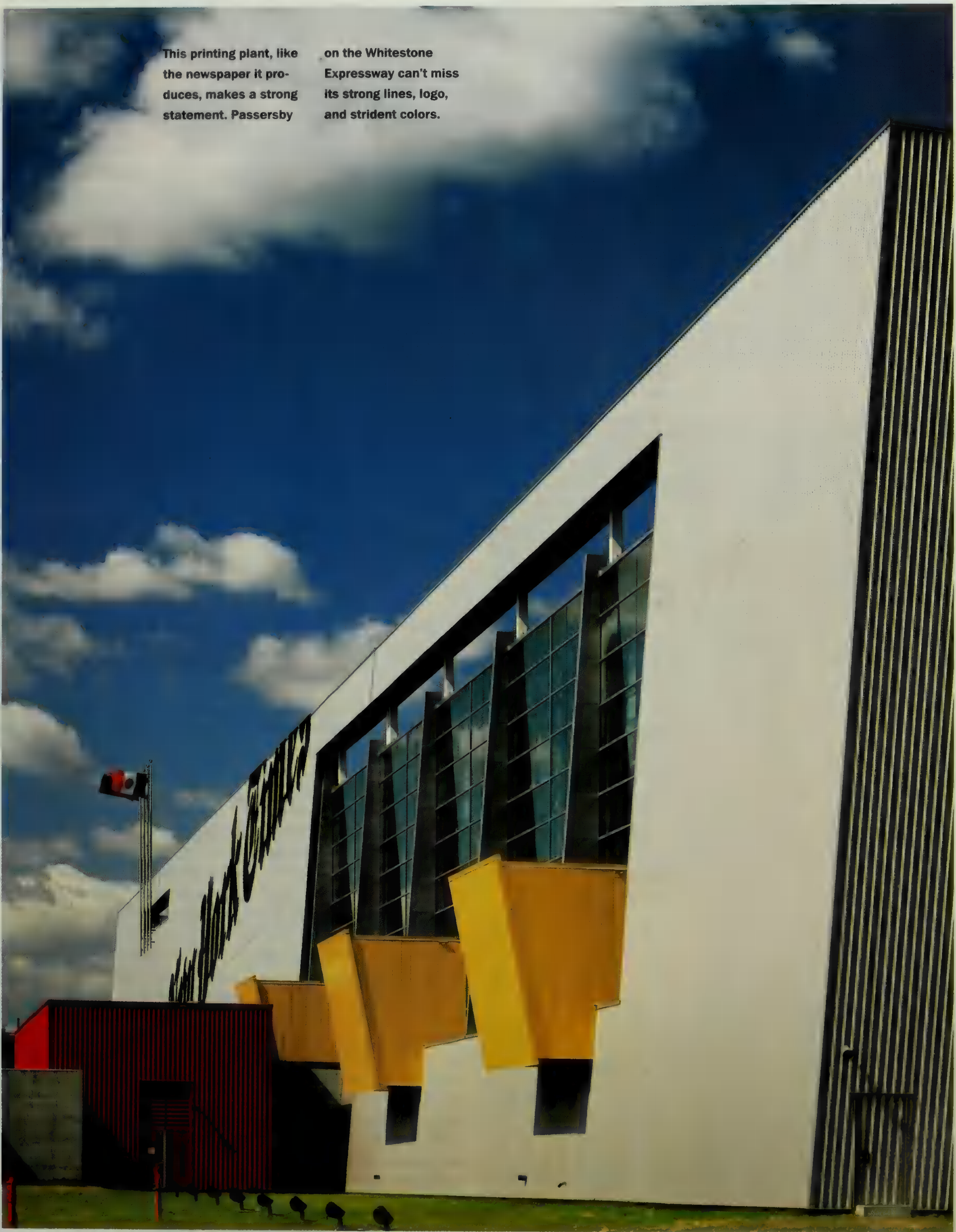
Using a design architect for printing plants is new to the *Times*. Says David A. Thurm, vice president for production, "This time we didn't want to house the newspaper printing process in an almost windowless


SITE PLAN



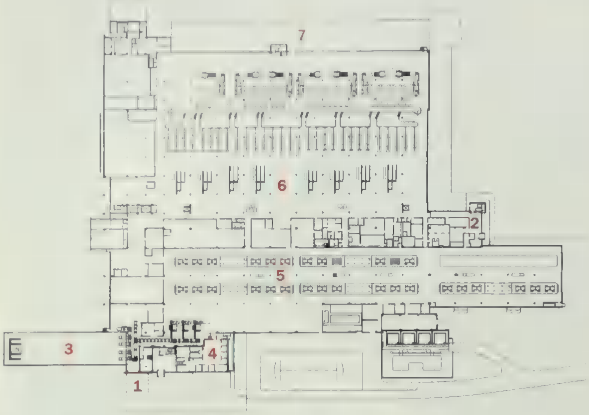
PHOTOGRAPHY: © JEFF GOLDBERG/ESTO

*Mildred Schmertz, FAIA, is a former editor-in-chief of* ARCHITECTURAL RECORD.

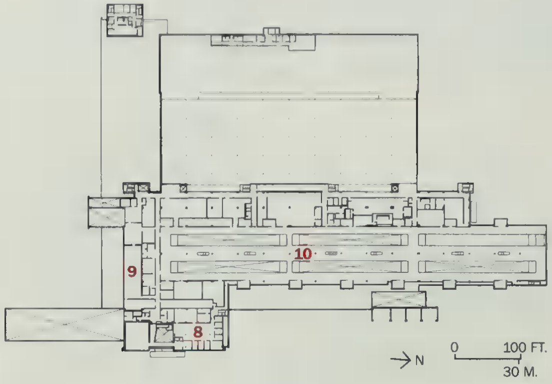


This printing plant, like the newspaper it produces, makes a strong statement. Passersby on the Whitestone Expressway can't miss its strong lines, logo, and strident colors.

PHOTOGRAPHY: © JEFF GOLDBERG/ESTO



FIRST FLOOR



SECOND FLOOR

1. *Entry*
2. *Employee entry*
3. *Paper roll storage*
4. *Administration*
5. *Press hall*
6. *Mail room*
7. *Loading docks*
8. *Administration*
9. *Cafeteria*
10. *Press hall*

**A sloping wall of glass (above) brings natural light to the mail room and loading dock. The exterior is low-cost rolled industrial steel siding (left). Some areas are painted to announce their function—yellow boxes house the ink mist filters, for example.**

factory-like box. We wanted our new plant to be a work of architecture that would clearly express from the exterior what goes on within." Thurm and his management team interviewed leading design firms to find one that could effectively organize the structural, foundation, electromechanical, automated printing, and employee support systems. Their goal from the outset was to minimize operations, maintenance, and capital costs. "Because we intended to use as much of the budget as possible for the very best printing equipment, we wanted a high-design building constructed with inexpensive but good-quality materials," Thurm reports.

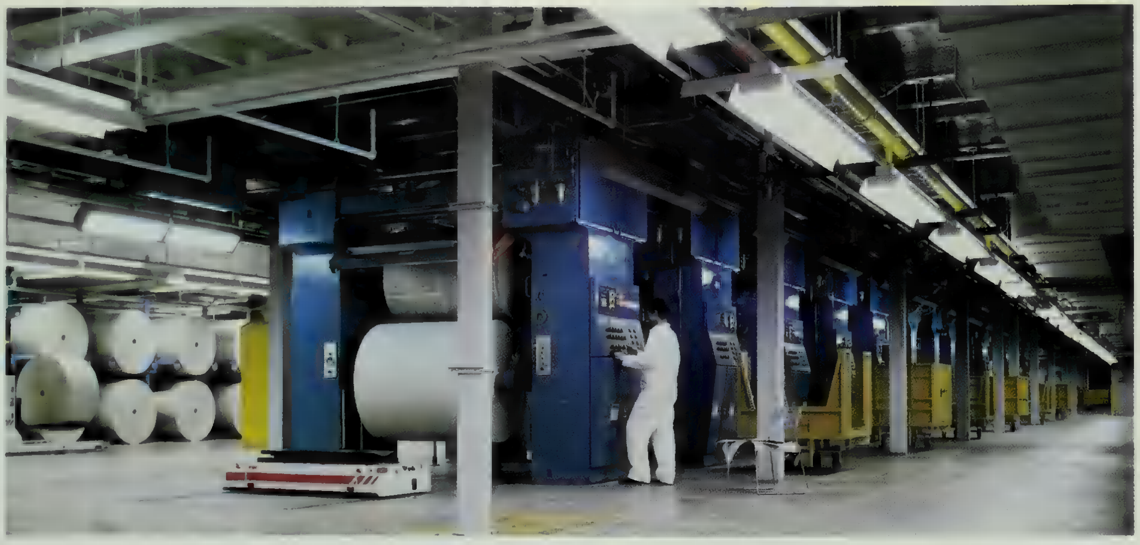
Instead of rounding up the usual experts in industrial design, the team looked for architects with a broad range of experience. "We didn't care if the firm hadn't done industrial buildings before. We asked them to show us the big spaces they'd designed—the gymnasiums and the concert halls. We picked Polshek and Partners because they had the vocabulary and understood the equipment, the process, and the money constraints."

Designing for the printing process meant there were some specific parameters: the linear nature of the printing operation; the vastness, weight, and complexity of the machinery; and the need for large unobstructed floor areas for the state-of-the-art presses. It was also up to design principals James Stewart Polshek and Richard M. Olcott to develop an efficient pathway for storing, sorting, packaging, and sending out the printed product. Threaded through this system were the offices, workshops, lockers, and lounges for the employees.

The search for an appropriate site for the new plant presented its own set of challenges. The *Times* looked at a number of Rust Belt locations that were inexpensive but required extensive cleanup. Instead, they chose the 31.7-acre site in Queens, which was suitably low-priced, Thurm says, because of "its terrible, chocolate-pudding soil." The sogginess is due, in part, to the land's proximity to the Long Island Sound. This condition forced the architects to define the smallest possible footprint for the plant to minimize the expensive friction piles needed to stabilize it on the sopping soil. Every square foot suddenly became precious.

To keep the interior compact and efficient, Polshek, Olcott, and their team, in collaboration with

**Money saved on building costs was invested in the computerized printing equipment located in the press hall (right and below). Robots carry and load the heavy paper rolls.**



Parsons Main, Inc., an A/E firm that specializes in printing plants, organized the building into seven components.

Near the highway edge is a glass curtain-wall box enclosing the public entrance lobby and administrative space. At the far west of the site, a huge loft, painted blue, contains the automatic storage and retrieval system for approximately 2,230 rolls of newsprint (each weighing about 1.2 metric tons). The paper comes from mills in Canada to warehouses in the Bronx. From there, it's delivered by truck to loading docks at the west end of the plant. Employees remove the sturdy wrapping from the rolls, then robots carry the paper to the presses.

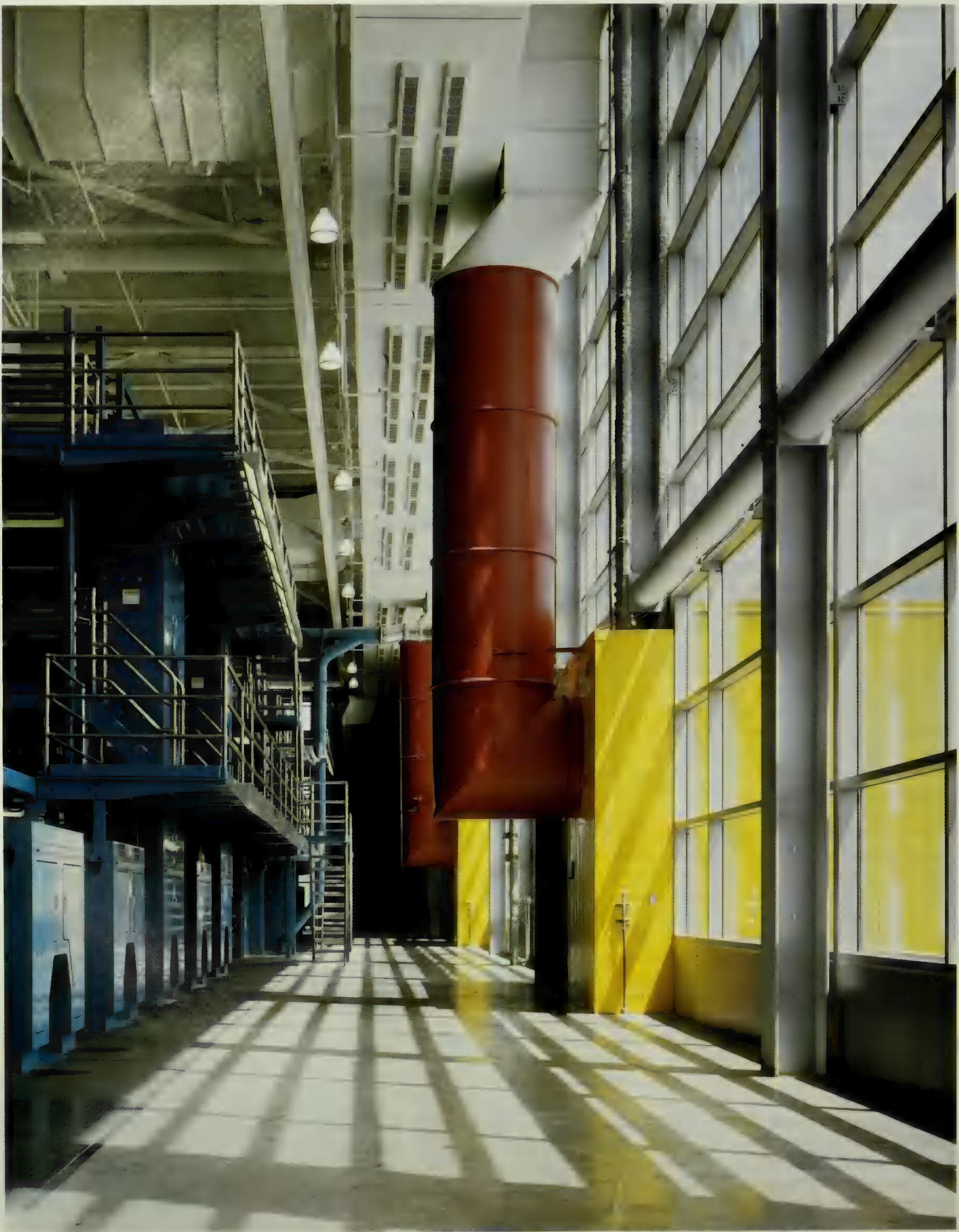
The 650-foot-long, three-story press hall has five 60-foot-high color presses and room for one more. The yellow-painted boxes that project from the building's facade contain filters that remove the fine ink mist generated during the printing process.

A three-story center spine contains the employee entrance, lockers, lounges, workshops, and computer control stations. The spine separates the press hall from the remainder of the plant, where the mail room, loading docks, and storage wheels for the printed sections are located. Interconnecting the two floors in this area are overhead paper conveyors, high-speed insert machines, sortation trays, palletizers, and other equipment used in the final stages of the production process.

Almost every kind of task traditionally performed by human beings was either reduced or eliminated in this plant. All of the heavy manual work is done by robots, whose position and status are tracked by sophisticated, integrated computer systems. Computers also indicate when a new roll of paper is loaded onto a press, how many copies are passing through a folding machine, and when an insert has failed to drop into place.

As a result of automation, the plant, which prints an average of 500,000 copies of the daily paper and 800,000 copies of the advance Sunday sections, has only 500 full-time employees. Workers transferred to the new facility from other plants in the area "see the robots doing the jobs their former colleagues used to do," Thurm says. It was up to the architects to find ways to create spaces that would heighten the sense of fellowship among the employees who work at the plant. That meant including plenty of windows for light and views. The cafeteria and lounge spaces are fresh and simple; and, thanks to careful acoustic treatments, they seem far from the pounding and rumbling of the printing presses.

Though the new equipment is engineered to be as quiet as possible, the printing and sorting processes are still noisy, demanding extensive soundproofing between the manufacturing and nonindustrial areas of the plant. For example, the interior wall surfaces of the press hall are lined with acoustic fiber-backed perforated metal, while window glazing is acoustical to cut down on the traffic noise entering



Printing presses are tall, long, and heavy. The architect had to provide enough unobstructed floor space and an adequate support system for six color presses (far left). Considering the volume of newspapers, there are surprisingly few employees—about 500 (left). Robots do much of the work. At the far west of the site, a huge blue loft holds about 2,230 rolls of newsprint (below).

from the Whitestone Expressway.

The architects produced 14 different structural schemes as input flowed from the design team, Olcott says. "At the beginning we thought it would be great to do a column-free structure with a tension-cable roof, but that proved expensive. So we built a structural steel grid with a flat roof and skylights. It turns out that columns belong in a printing plant anyway. They brace and support the equipment and help to order the vast spaces."

Olcott solved the problem of making the building, essentially a long box, sit gracefully on the site by adding what he refers to as "a few Deconstructivist tweaks." The front facade of the press hall tilts slightly and extends above the roof line to conceal the mechanical equipment. From the ground, a sliver of sky can be seen within a punched-out section of the facade above the five-bay-wide glass curtain wall. The diagonal supergraphic sign that faces the Whitestone Expressway resembles the diagonal signage of the *New York Times'* delivery trucks.

Thurm allowed the design process to get far along—about halfway through working drawings—before he brought in 40 people to the construction manager's office, including maintenance engineers, workers from the press room, and the architects and their consultants, for a three-day conference. He hoped to find ways to reduce costs before construction started, and to make sure that there would be minimal change orders.

On the first day of the conference, the group reviewed structural, electrical, mechanical, and site details. On day two, the group divided into four teams: architects; mechanical, electrical, and structural engineers; site consultants; and those involved in designing or running the printing process. Each group was given a preliminary estimate of what its share of the project would cost. On the third day, each team suggested cost-saving changes in its category of expertise. "We saved $4 million in those three days," Thurm says.

The result of this process is a lively, colorful building that's readily visible from the highway and brightens an otherwise dreary industrial area. ■

**Sources**

**Structural system:** *Interstate Iron Works Corp. (wide-flange material)*
**Ground-faced CMU:** *Plasticrete*
**Interior glazed masonry unit:** *Spectra Glaze*
**Metal/glass curtain wall:** *EFCO Corp.*
**EPDM roofing:** *Carlisle*
**Skylights:** *Skywall*
**Paints and stains:** *Sherwin-Williams*
**Tile:** *Dal Tile*

## 2

# Mercedes-Benz M-Class Assembly Plant Tuscaloosa County, Ala.

### GERMANY MEETS ALABAMA, AND 1,500 JOBS ARE CREATED IN A RURAL AREA BADLY IN NEED OF ECONOMIC DEVELOPMENT.

**by Phillip Morris**

**Project:** *Mercedes-Benz M-Class Assembly Plant, Tuscaloosa County, Alabama*
**Owner:** *Mercedes-Benz U.S. International*
**Architect:** *Albert Kahn Associates—George Barbu, project principal; Tony Grego, AIA, designer; Kenneth Chevrier, architect; Lawrence Bechard, project manager; Carol Kordich, interior designer; Peter Lynde, mechanical engineer; John Schuster, electrical engineer; John McClary, structural engineer*
**Associate Architect:** *Gresham, Smith and Partners*
**Consultants:** *Grover Harrison P.C. (landscape); E. F. Whitney (kitchen)*
**General Contractor:** *Fluor Daniel*

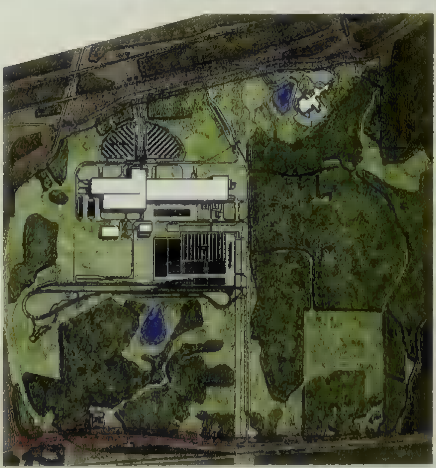
**Size:** *1 million square feet*
**Cost:** *$300 million*

Spread out amid the pine trees along Interstate 20/59 between Tuscaloosa and Birmingham, Alabama, the new $300 million Mercedes-Benz M-Class Assembly Plant is the product of a melting pot of corporate, ethnic, and regional cultures. The success of the building's design lies in the fact that these various groups were able to communicate, creating a commonality out of different backgrounds.

Employees setting up the production and manufacturing of the company's new, award-winning "all-activity" vehicle included key personnel recruited from GM, Chrysler, and the American operations of Toyota and Nissan; newly trained Alabama natives; and administrative and technical representatives from Mercedes headquarters in Stuttgart, Germany, as well as other German locations. It would have been simpler for the company to just import its way of doing things from Germany, the usual method Mercedes employs when conducting business in foreign countries. But the goal in Alabama was to plow new ground, both literally and conceptually.

"I remember one meeting of the team in Tuscaloosa where we debated until eleven p.m. whether to have an E-shaped plant, a T-shaped plant, or something else altogether," says Reiner Gors, project architect for Mercedes-Benz. "And this was before we even went to the architects." At the recommendation of general contractor Fluor Daniel, the decision was made to build a rectangular plant to facilitate communication and interaction among the body, paint, and assembly operations (typically located in separate wings), and to use the U.S. firm most experienced in automotive plant design, Albert Kahn Associates.

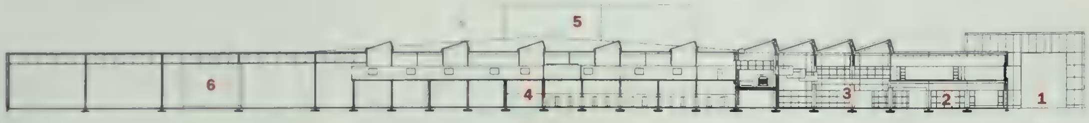
At 1 million square feet, the plant is not large compared to most assembly factories. Current capacity is lower than most, however, at 75,000 vehicles a year. A typical



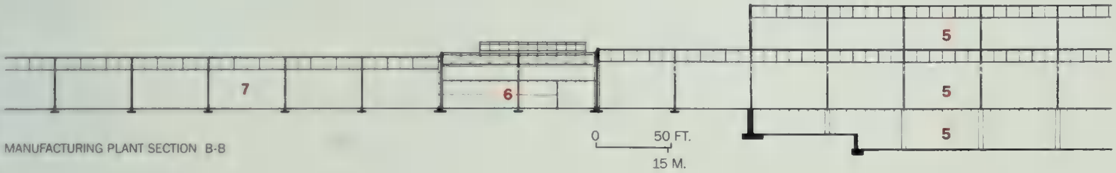
**Located on the site of a former tree farm, the Mercedes plant has its own exit off the nearby interstate. The State of Alabama invested more than $90 million in infrastructure.**

*Phillip Morris is an honorary member of the AIA and an editor-at-large for Southern Progress Magazines in Birmingham, Alabama.*

PHOTOGRAPHY: © GARY QUESADA/HEDRICH BLESSING, EXCEPT AS NOTED

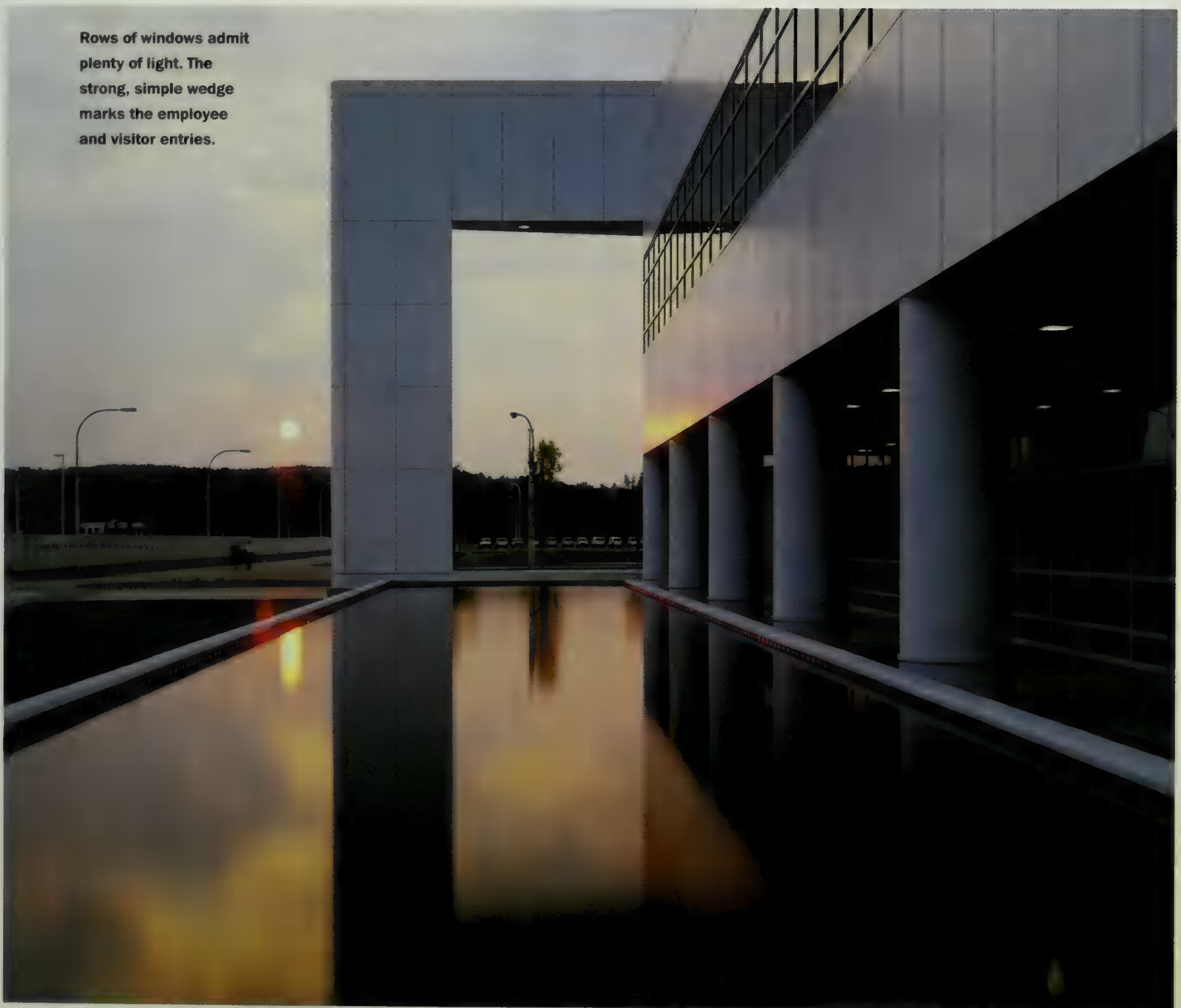


CENTRAL SERVICES SECTION A-A



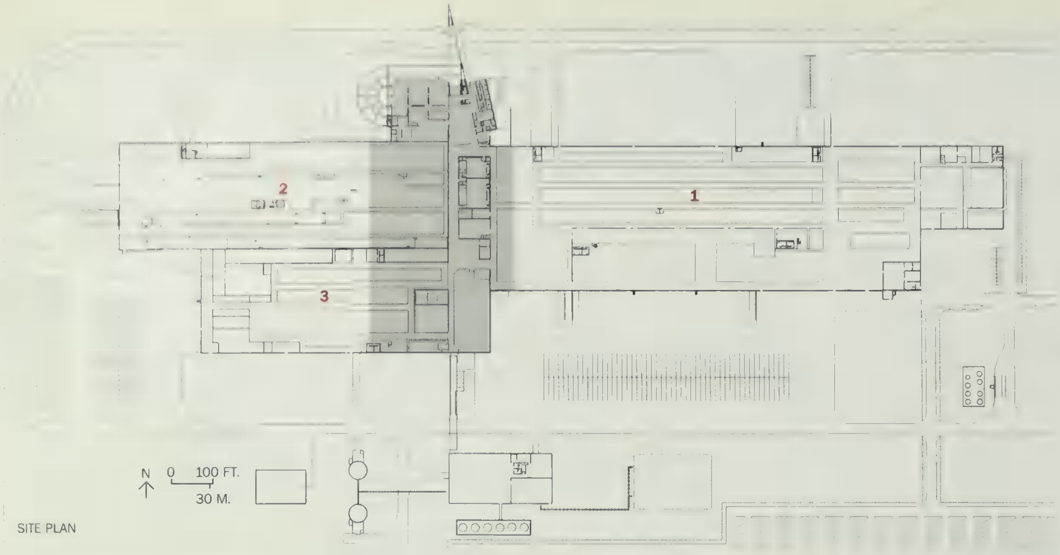
MANUFACTURING PLANT SECTION B-B

1. *Entry*
2. *Visitor area*
3. *Lobby*
4. *Production offices*
5. *Paint shop*
6. *Body shop*
7. *Assembly shop*



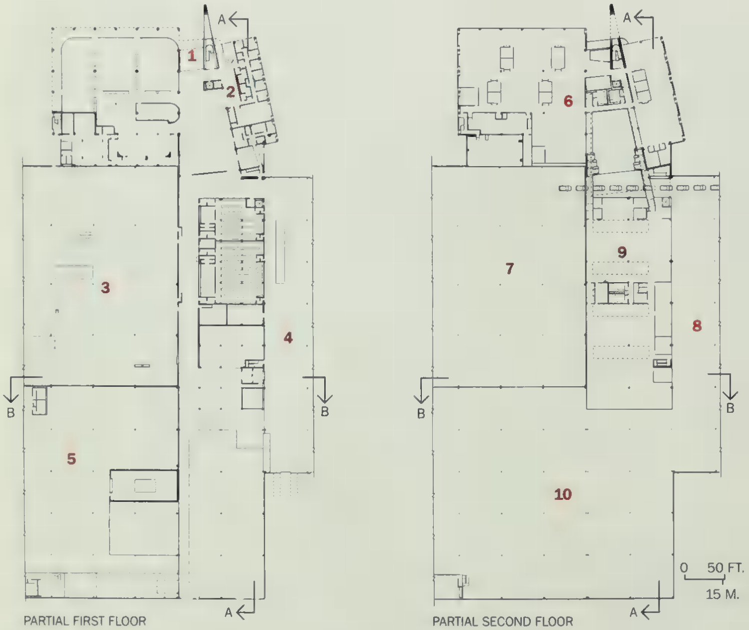
**Rows of windows admit plenty of light. The strong, simple wedge marks the employee and visitor entries.**

HEDRICH BLESSING, EXCEPT AS NOTED



SITE PLAN

1. *Assembly*
2. *Paint*
3. *Body*



PARTIAL FIRST FLOOR

PARTIAL SECOND FLOOR

1. *Entry*
2. *Visitor area*
3. *Paint shop*
4. *Assembly*
5. *Body shop*
6. *Administrative offices*
7. *Upper paint shop*
8. *Upper assembly*
9. *Production offices*
10. *Upper body shop*

U.S. plant produces about 250,000 vehicles. The 966-acre site affords room for expansion. Operations have been designed so that 80 percent of the M-Class parts come already assembled by suppliers, helping to reduce necessary plant size and personnel.

The State of Alabama put together a $253 million package to lure the foreign car manufacturer in hopes of putting the state on the global economic map. Alabama's growth rate is glacial compared to that of neighboring states. According to Mercedes, all 50 states sent site proposals to attract the automaker, but Alabama's was the most tempting. Among the incentives were $90 million for training, $15 million toward a new training center, direct payments for each job provided at the site, and more than $95 million in infrastructure and site work.

Mercedes-Benz's reputation for quality was combined here with a strong push for cost efficiency. The plant was begun in 1995 and finished on time and under budget. The fact that the site had been prepared for development by the state was helpful, as was the straightforward steel erection technique.

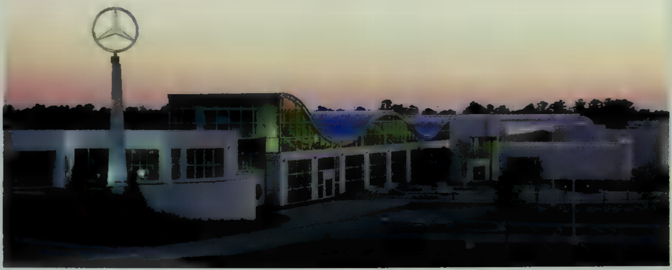
The plant's rectangular layout emphasizes the importance of teamwork and quality. By locating the body, paint, and assembly shops adjacent to each other and

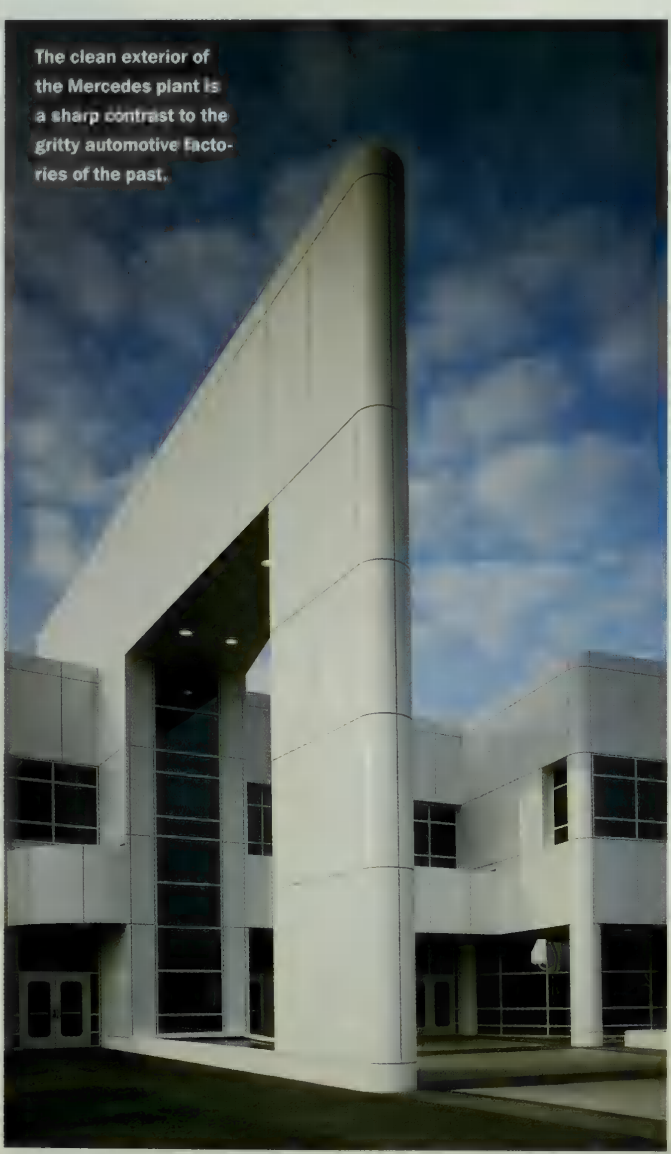
**Employees, some of whom came to Alabama from Germany and Japan, eat lunch al fresco when the weather is nice. The cafeteria, at the north end of the building, seats 650 people.**

PHOTOGRAPHY: © GARY KNIGHT (SIDEBAR)

**Mercedes-Benz Institute and Visitor Center** Zipping along I-20/59 in Tuscaloosa County, Alabama, it's impossible to miss the Mercedes-Benz logo atop a tall pylon and a roller coaster of a roof. Welcome to the Mercedes-Benz Institute and Visitor Center, designed by Gresham, Smith and Partners' Birmingham office and located about 600 feet away from the M-Class Assembly Plant. The 100,000-square-foot structure consists of three elements: a customer delivery space, a visitor's center with a Mercedes museum, and, the largest component, the plant's employee training center.

Using the same off-white exterior panels as the plant, the building is a complement to its neighbor. As in the plant, openness and communication are this building's major themes. Classrooms on a mezzanine overlook the shop training area below. Visitors view the training process through windows. "The client wanted a visual tour de force that could be read quickly from the interstate and make passersby curious," says Bill Jordan, AIA, project architect. An undulating roof of silver standing seam metal was inspired by the famous gull-wing sports coupe and evokes the kind of terrain the M-Class utility vehicle is intended to master. *P.M.*





The clean exterior of the Mercedes plant is a sharp contrast to the gritty automotive factories of the past.

PHOTOGRAPHY: © GARY KNIGHT (SIDEBAR)

connecting them with an administration and employee area, the layout makes it possible to see what's happening throughout the line, facilitating communication. It also reduces shop-to-shop conveyor links.

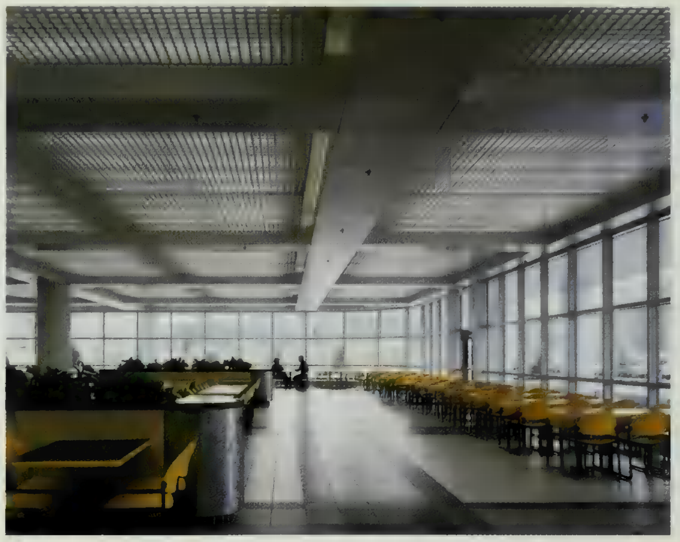
"We have worked with the Japanese and American auto manufacturers for many years, and with BMW on their new Spartanburg, South Carolina, facility," says Alan Cobb, AIA, who serves as director of architectural design for Albert Kahn Associates and worked with designer Tony Grego, AIA, to develop the plant's program. "The hallmark of the Mercedes approach is to look at the best practices in the United States, Germany, and Japan, and design to state of the art."

In plan, the plant is an irregular bar following an east-west alignment roughly paralleling the nearby interstate highway. Body and paint components are placed side by side to the west of a central service spine. The longer assembly component extends to the east. The site also features employee and visitor parking, truck marshalling yards for delivery and loading, an energy center, a hazardous-waste handling facility, a tank farm, and outbound-vehicle staging lanes. Placed several hundred feet to the northeast and within full view of the highway is the Mercedes-Benz Institute and Visitor Center (see sidebar), which also serves as an employee training facility.

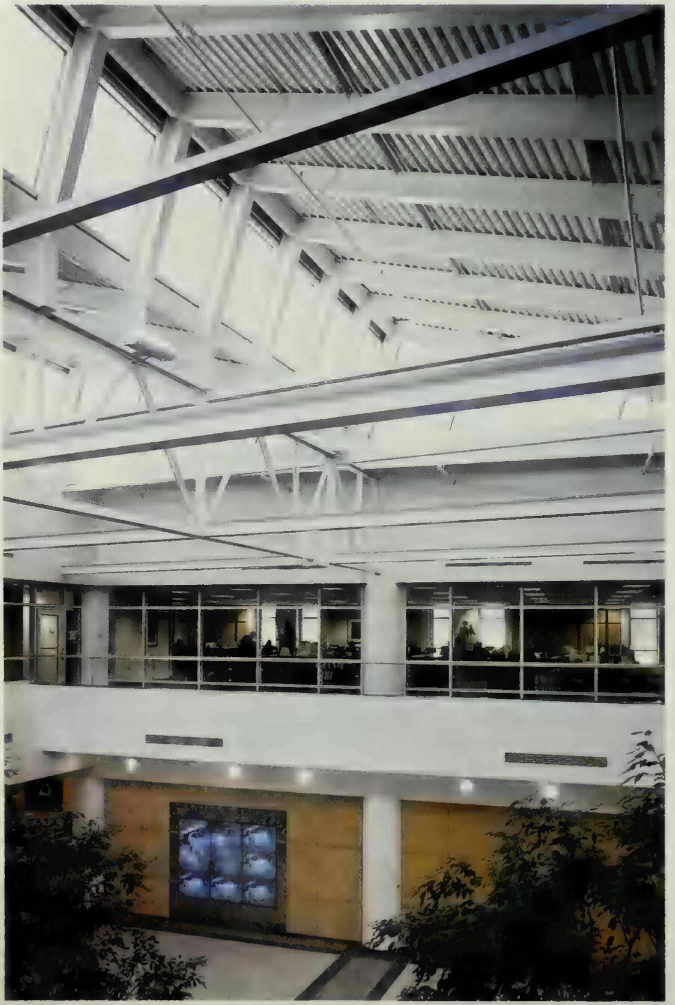
The plant entrance is boldly marked by a full-height, open center wedge that thrusts out from the spine. The wedge and the spine's forward extension are clad in white powder-coated rectangular aluminum panels. The bulk of the plant is sheathed in vertically hung off-white metal siding. All employees, from administrators to assembly-line workers, enter here, as do visitors; the former go in to the right of the wedge and the latter angle off to the left.

"Communication was the most important aspect of the functional plan," Cobb says. "We needed to make sure people could come together easily, and the architecture of the entry and atrium space was intended to symbolize that emphasis on communication. Everyone passes through this space."

Opposite the visitor reception center, which is where factory tours begin, and beyond the two-story lobby, with its product and quality displays, is a spacious cafeteria. Employees look out through glass walls, over reflecting pools, to the pine trees and distant hills. There is also an outdoor dining terrace. This sequence of spaces flows together gracefully, striking a balance between precision and warmth with ceramic tile floors, maple paneling, and crisp metal trim.



**Ready to roll, the new "all-activity" vehicles (far left) are examined in the service and test lot before being shipped out. About 70 percent of the product is destined for the American market. The cafeteria (left) was a necessity; there are no restaurants nearby. The space gives employees a place to socialize.**



**In melding German, Japanese, and American approaches to car manufacture, communication became the overarching design concern. Glass partitions and open spaces are used throughout. From the administration offices (above), employees can see over the lobby to the assembly areas.**

Evidence of the plant's purpose is clearly visible in the 41-foot-high lobby: a glass-encased conveyor at the second level moves painted vehicle bodies from the body-and-paint side of the plant to the assembly side. This same moving line of glistening auto bodies can also be seen from the production offices and the administrative offices on the second level. The latter are located above the cafeteria and enjoy the same vistas of the Alabama countryside.

Sawtooth roof monitors with clerestory windows evoke early automotive factories designed by Albert Kahn, specifically the original Ford Model T plant in Highland Park, Michigan. Here they are used to bring light into the atrium and second-floor office spaces.

Consistent with the under-one-roof design and the emphasis on teamwork based on the Japanese model, offices for body, paint, and assembly-production teams are centralized and open to each other and to the assembly operations below. The paint shop is visible—but through glass. The area is sealed and pressurized to keep the fine, red clay dust that can sift through the smallest openings from ruining a good paint job.

The structural and exterior design of the Mercedes plant follows the internal agenda, with the exception of the wedge, the only decorative element. "The exterior is an envelope which may even be temporary," Cobb points out. "With Mercedes people, we decided on a husky rib siding without any horizontal girts to allow for flexibility and expansion."

The success of the M-Class vehicle in the U.S. market, where 70 percent of the plant's production goes, has brought the number of employees at the Alabama facility up to the projected 1,400, with an additional 100 jobs expected by the end of the decade.

Thanks to all the different cultures that were brought into the mix, Mercedes-Benz's first North American facility has emerged as its own hybrid. So much so that German visitors traveling to Alabama to visit the plant and test drive vehicles are disappointed in one thing: the cafeteria does not serve good beer. ■

**Sources**

**Columns, trusses, purlins:** *Qualico Steel Company*
**Exterior cladding:** *Centria*
**Elastomeric roofing:** *Stevens Roofing System*
**Insulation:** *Atlas Energy Products*
**Glazing:** *AFG Industries*
**Aluminum entrance doors:** *Special-Lite*
**Hollow metal doors:** *Mesker Door Company*
**Wood doors:** *Algoma Hardwoods*

3

# Valeo Electrical Systems San Luis Potosi, Mexico

## FLEXIBILITY, EASE OF EXPANSION, AND COMMUNICATION AMONG EMPLOYEES WERE TOP PRIORITIES IN THIS AUTOMOTIVE PARTS PLANT.

**by Mildred Schmertz**

**Project:** *Valeo Electrical Systems, San Luis Potosi, Mexico*
**Owner:** *Valeo*
**Architect:** *Davis, Brody & Associates, LLP—Steven Davis, FAIA, Chris Grabe, AIA*
**Engineer:** *Ove Arup & Partners*
**Consultants:** *Biaani Lighting Consultants (lighting)*
**General Contractor:** *Contreras & Associates*

**Size:** *100,000 square feet on one level*

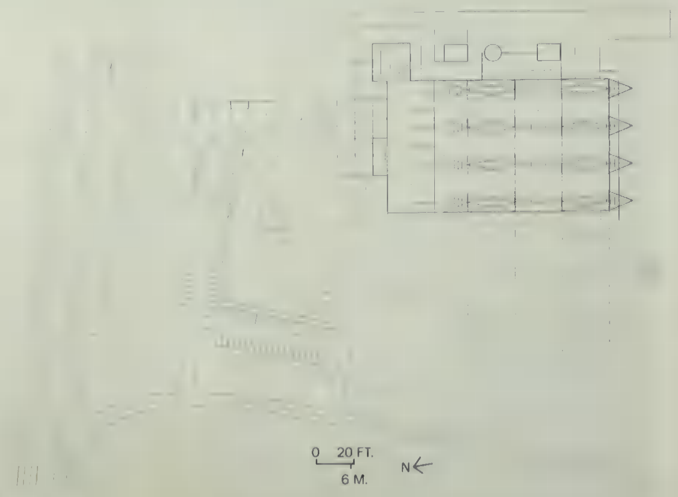
In the small city of San Luis Potosi in Mexico, there's an intriguing new factory building that houses the manufacture and assembly of a decidedly unintriguing product: electrical motor systems for automotive windshield wipers. The building was designed by Davis, Brody & Associates for Valeo, a French-owned automotive-components manufacturer that serves major truck- and carmakers worldwide. There are many automobile plants in San Luis Potosi, including Ford and Chrysler, Valeo's chief local customer.

The city, a four-hour drive south from Mexico City, once relied on nearby gold and silver mining for its economic base but now counts on the money generated by industrial development. Although the area is not particularly remote, it is in a part of the world in which Davis, Brody & Associates had no prior experience. To complete the building on time and within budget, the architects had to familiarize themselves with locally available materials and labor.

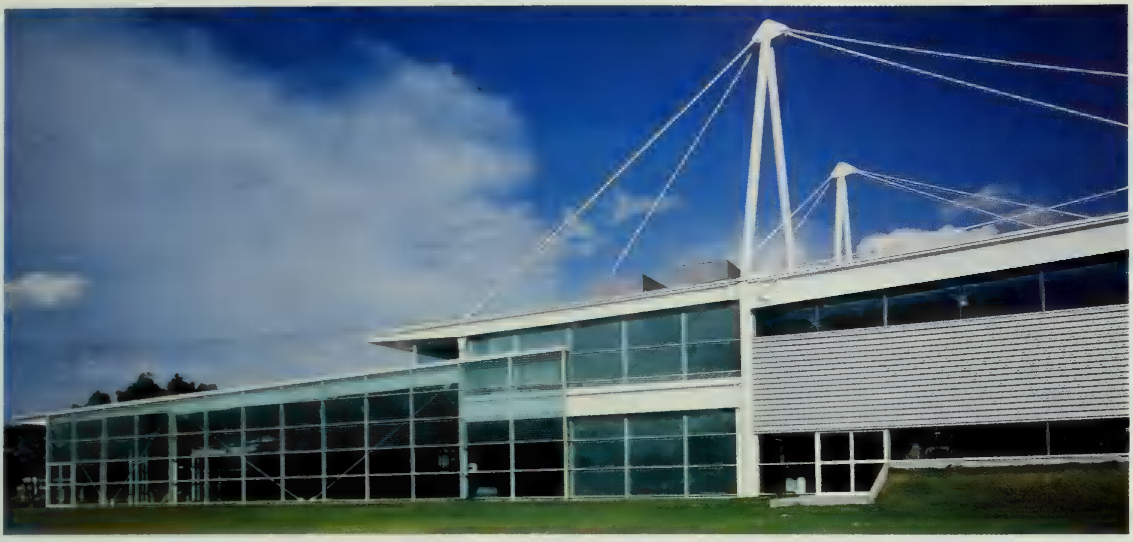
Valeo assisted in this process by hiring a liaison who worked with the contractor and the architect to assess the look, quality, and availability of various products. The team discovered a wealth of talented steelworkers in the area who could weld and assemble component pieces at a reasonable cost and more quickly than if premanufactured pieces were imported. They also discovered that because there are so many industrial buildings in the vicinity already, workers are well versed in this type of construction and can work quickly.

At the client's request, Davis, Brody completed the design work quickly—within two and a half months. Thanks to the highly skilled local labor force, the production line segment of the factory was up and running six months after construction began, says principal Steven Davis; the administration area was finished four months later. Moving at this fast pace was essential: Valeo had order commitments to fulfill and wanted to minimize downtime.

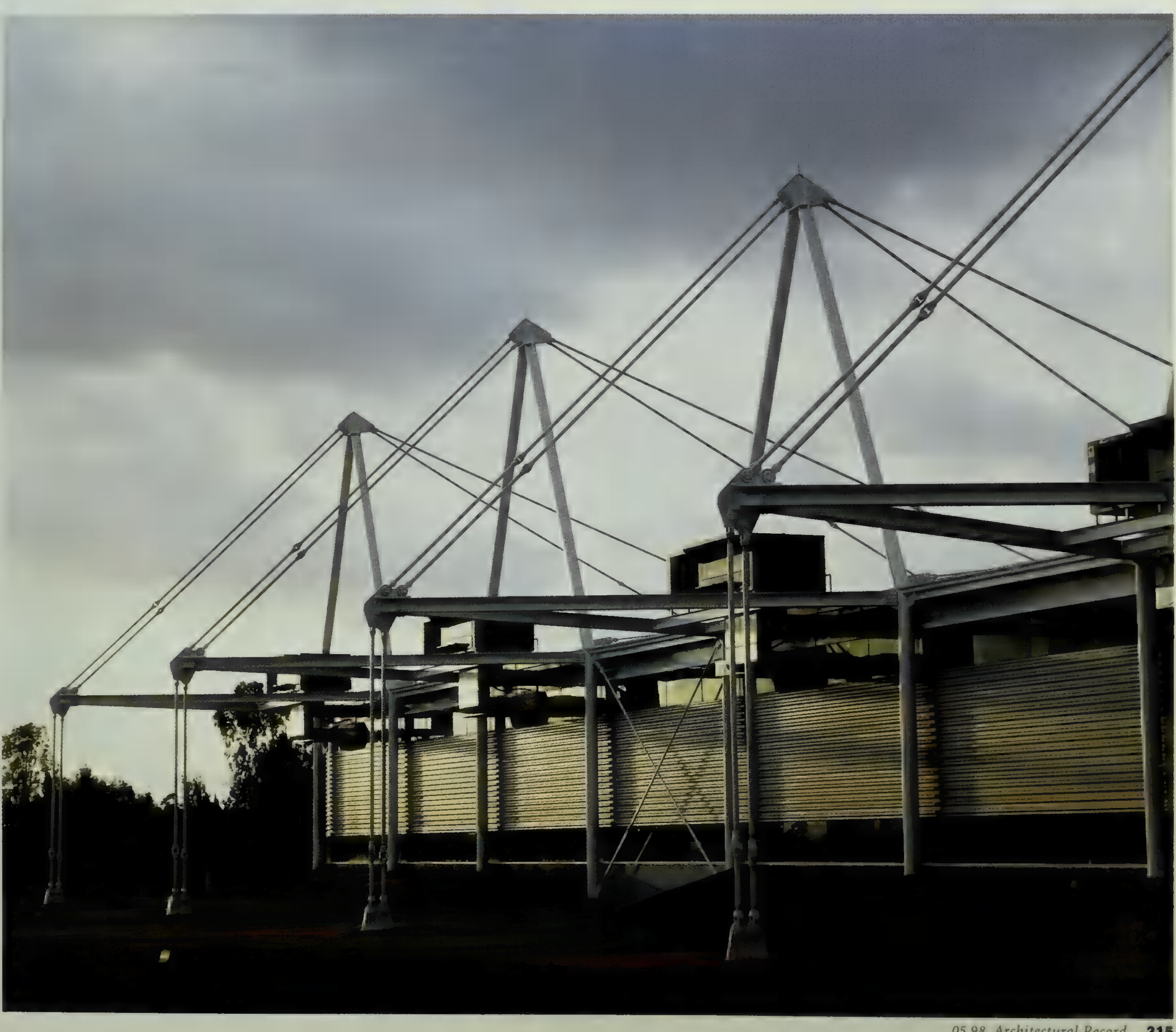
The flat, 16-acre site is bordered to the northeast by the major, four-lane highway linking San Luis Potosi and Mexico City. To the northwest and southwest are secondary roads, and to the southeast is another industrial property. The architects capitalized on the visibility of the site by making the facades that are visible from the highway as clean and attractive as possible. The impact of the service yard, with its truck dock, water tank, and mechanical and electrical equipment facilities, was minimized by placing it adjacent to the industrial plant. The facility's presence on the highway is enhanced by expanses of indigenous grasses, plantings, and trees.

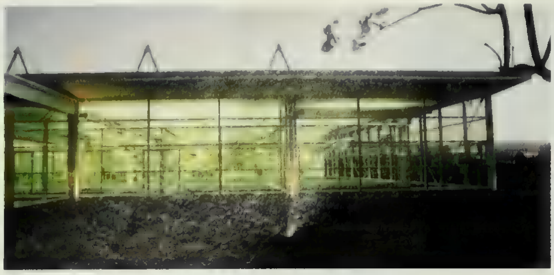


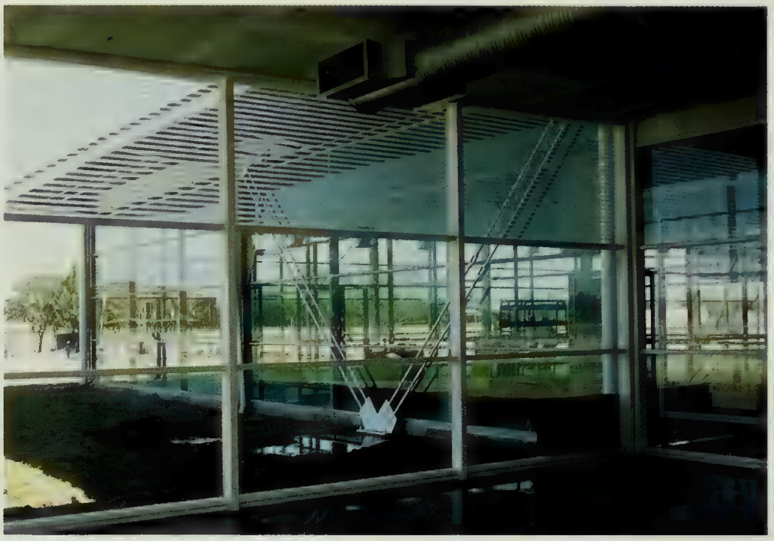
SITE PLAN



The mostly glass entry and lobby area (left) faces a major highway running from San Luis Potosi to Mexico City. The custom-fabricated roof-support system (below) looks like a ship's riggings.







**Broad eaves mitigate the effects of the hot Mexican sun, while expanses of glazing allow views of the hills that surround the site (above and right). Valeo located its operations here because of the concentration of automotive plants. An added benefit was the wealth of skilled steelworkers who could fabricate the complex trusses and fasteners.**

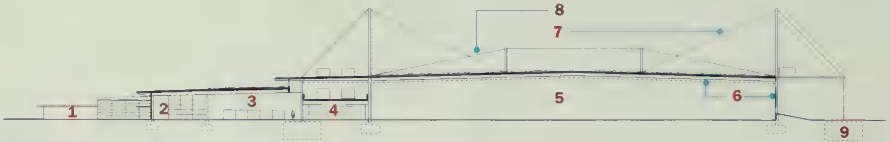
Spindly jointed trusses, along with abundant glass and broad eaves, make this otherwise simple, rectangular building noteworthy. Part of the rationale behind this presentation is Valeo's conviction that the architectural quality of a building is directly related to the quality of the products manufactured there. As the corporate reasoning goes, the precision that's evident in the trusses must also be evident in the components that are produced beneath them.

The main entry, administration, and common areas are located to the northeast, facing toward the arterial highway. The glass-enclosed facade of this public portion offers an open, attractive view of the activities taking place within and of the cactus-covered hills outside. To the northwest, sufficient land remains for the plant to eventually double in size. Little of the site is taken up by parking lots since most employees commute by bus or bicycle.

In planning the facility, Davis, Brody focused on three goals: the ability to expand in a manner that will allow production to continue during the process; flexibility in the arrangement of the manufacturing equipment and its services; and ease of visual as well as electronic communication among the departments. It was also important to the client that the building be adaptable to new and future production techniques. As architecture, the factory was to signify and embody the high level of technology and research that governs the manufacturing process within, as well as express the corporation's commitment to quality and innovation.

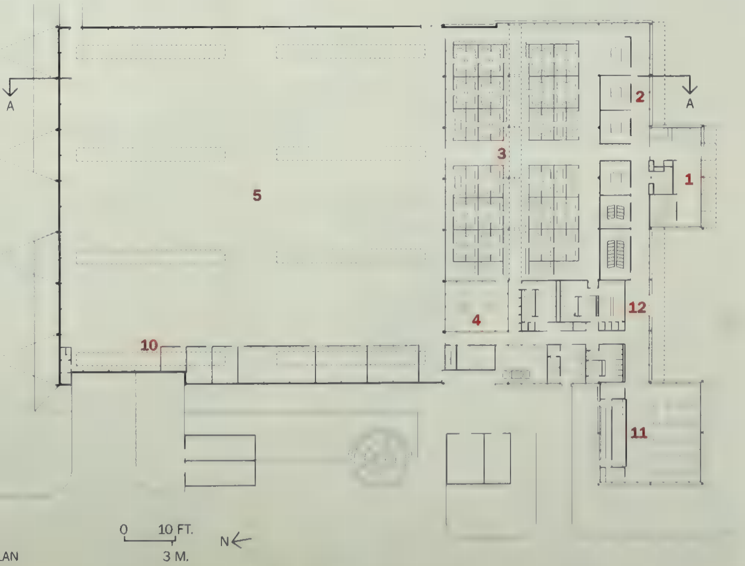
The program for the 100,000-square-foot, one-story facility required areas for fabrication, research laboratories, administration, and teleconferencing; a training center; a lobby with an exhibition space for visitors; a small infirmary; and a cafeteria serving local cuisine for employees.

Easy communication between the departments was possible in this factory mainly because the operation is not as noisy, dusty, and dangerous as other automotive-related industries. The first step was to place the administrative area directly adjacent to the fabrication floor. A row of research laboratories, all of which open onto and serve the fabrication space, defines the southeastern edge of the administrative area. Glass partitions, which block the relatively small amounts of dust and noise, were used to encourage visual contact among the departments. "The vice president can see straight through from his office to the laboratories and fabrication floor, and people working

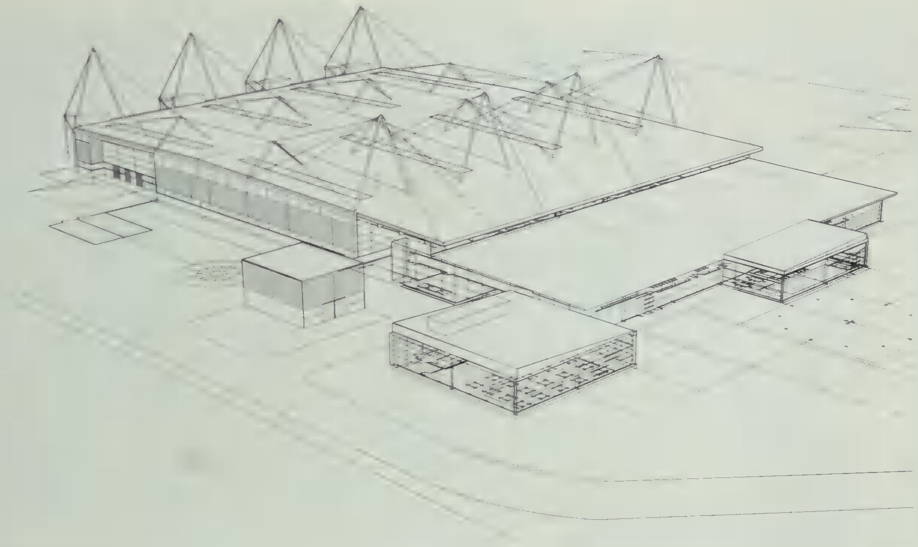


SECTION A-A

1. *Entry*
2. *Training/conference*
3. *Administration*
4. *Laboratories*
5. *Fabrication*
6. *Utility grid*
7. *Girder support rods*
8. *Wind uplift rods*
9. *Concrete counterweight*
10. *Incoming materials*
11. *Cafeteria*
12. *Employee entry*



FLOOR PLAN



**Eliminating columns in the fabrication area made the space more flexible, but it also necessitated the dramatic fretwork of columns and tension rods that make the truss system so striking.**

there can look back and see him," Davis says.

The administration offices are defined by low partitions that are demountable for flexibility. The open-landscape approach demonstrates Valeo's nonhierarchical standards for corporate space.

The areas allotted to fabrication, storage, laboratories, and administration are completely flexible. The building can be transformed from one that produces more than one million wiper systems per year to a manufacturing facility for automobile headlights, security systems, or several products at once. This allows Valeo to react quickly to the needs of the marketplace.

The column-free fabrication area shares the same grid-based proportions as the columnar system of the administrative wing. This repetitive module will allow the anticipated expansion to occur easily to accommodate the requirements of the client. In addition, the fabrication, laboratory, and administrative areas can grow in the same proportions as those of the original plan, or they can expand independently, based on need.

The mechanical and electrical services were also designed using a modular approach. In the fabrication area, there's an overhead utility grid of electric buss ducts, data lines, compressed air conductors, chilled water pipes, and exhaust ducts. Vertical utility drops are grouped together and then horizontally connected to individual pieces of equipment. This permits easy attachment to the production equipment, regardless of its layout, and leaves the fabrication floor, a concrete industrial slab, free of conduits, allowing equipment to be jockeyed around.

The building services in the administration and laboratory areas were designed to provide similar flexibility. Lighting, heat, and cooling systems are suspended from the ceiling to provide a uniform comfort and work level. Unlike the fabrication space, the administrative section has under-floor conduits through which data and electricity are fed to the furniture system and then carried through the furniture to the desktop.

The fabrication area is 56,500 square feet of open space. "If the client wants to be able to change the production line for innovations, it is inhibiting to have columns on a traditional rigid grid," Davis says. "Mapping the manufacturing sequence so that it missed columns would have inhibited flexibility and adaptability, and also cost space." To prove this theory, the architects asked Valeo's production people to lay out the fabrication process in a column-free sequence. Their investigation revealed that a column-free floor area could be 10 percent

**An overhead utility grid in the fabrication section of the plant conducts electricity, water, compressed air, and whatever else is necessary to run the equipment on the production floor (right). Putting these supplies above meant the floor could be clear of hookups, allowing machinery to be moved around without hindrances. The space is also made safer for employees as a result.**

**Though Valeo's operation is set up to produce windshield wiper motors, the company can reconfigure the plant to produce other automotive supplies. Laboratories (above) are adjacent to the fabrication space, encouraging interaction among employees.**

smaller than one with columns.

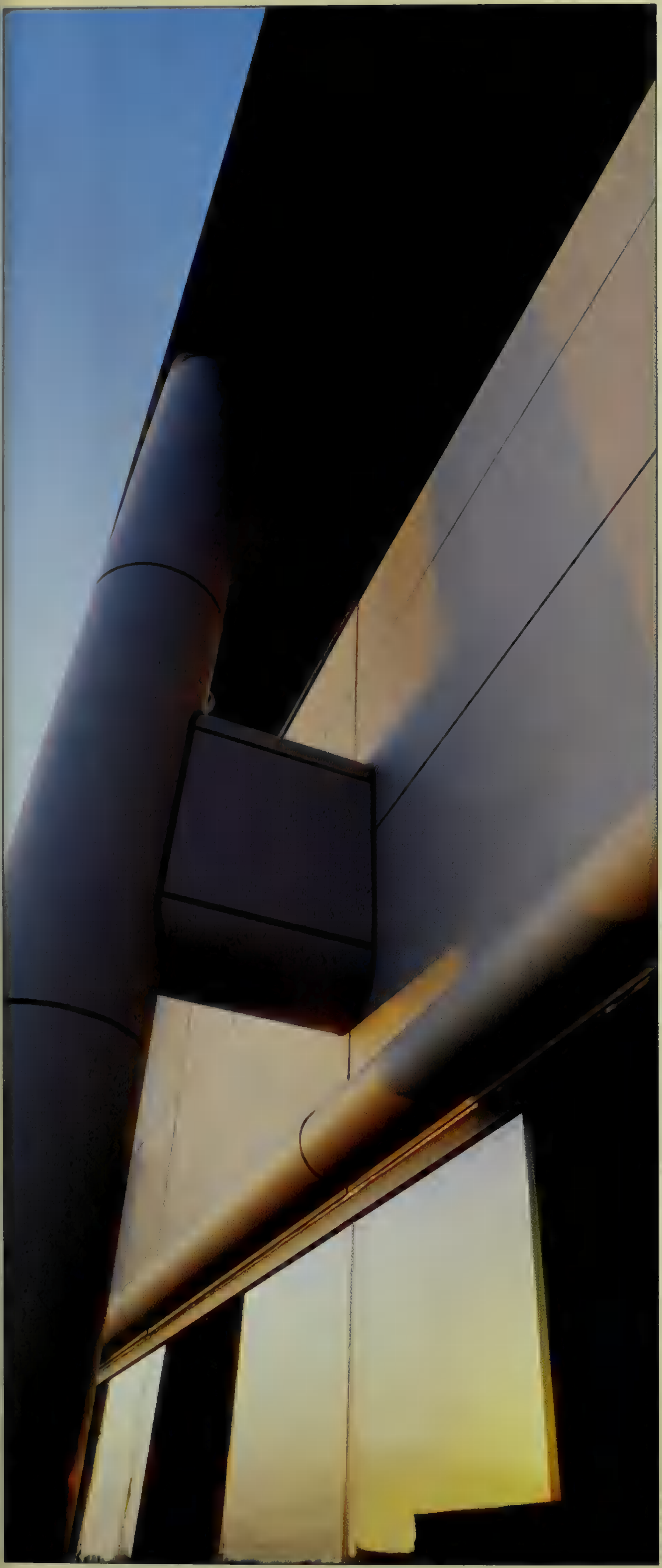
Calculations from consulting engineers Ove Arup & Partners bore similar results when it came to choosing the structural system. They compared the cost of steel for a standard, 82-square-foot rigid-bay factory structure with the cost for a long-span structure. The team determined that a factory with columns would require 110,000 square feet, but a column-free space would require only 100,000 square feet. On a dollar-per-kilo basis, the weight of the steel needed to build the larger plant was, naturally, greater than that needed for the smaller building. Though long-span systems are more complicated to build, the savings on the cost of materials more than offset construction costs.

The 245-foot-long roof is held in place by a system of trusses that resembles those used on suspension bridges. A-frame pipe column masts, rising 33 feet above the roof, provide the support for the tension-rod hangers. These carry 40-inch plate girders that divide the load of the building's long span into thirds. The rods then connect to back-span supports. The entire system is anchored vertically by reinforced-concrete, underground counterweights that are 27 feet square and 10 feet deep. To gauge the immensity of these weights, consider that each one weighs 310 tons—that's 13 cement mixers worth of concrete. The outriggers of the structure are used as dunnage for the air-conditioning chillers, which also serve as counterweights. Wind-uplift requirements are met by a less dramatic A-frame, tension-rod system, which ties down the roof in thirds along the long span.

Some of the components for this complex support system, including the rolled steel sections, aren't manufactured in Mexico. The mild-steel tension rods, for example, were imported from the United States. But local welders were able to fabricate the steel-plate girders and I-beams. "We wanted to take advantage of those skills and local products," Davis says. "We were bold enough to invent a sophisticated long-span structural system because we knew that the Mexican workers could build what they were presented with." ■

**Sources**

**Joists and plate girders:** *Capo Estructuras*
**Curtain wall:** *Argo Estructuras*
**Concrete:** *C&A*
**Metal roofing:** *Cano Estructuras*
**Steel:** *C&A*
**Glazing:** *Potosina de Aluminio*
**Skylights:** *Meda*
**Plastic glazing:** *Kalwall*
**Entrance doors:** *C&A*
**Acoustical ceilings:** *Armstrong*
**Flooring:** *Mannington*



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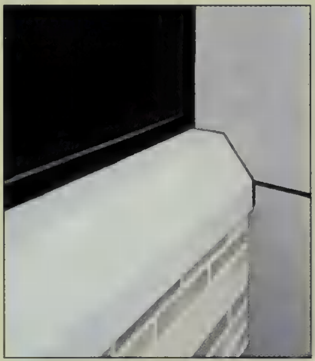

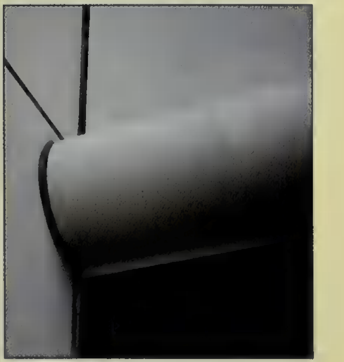

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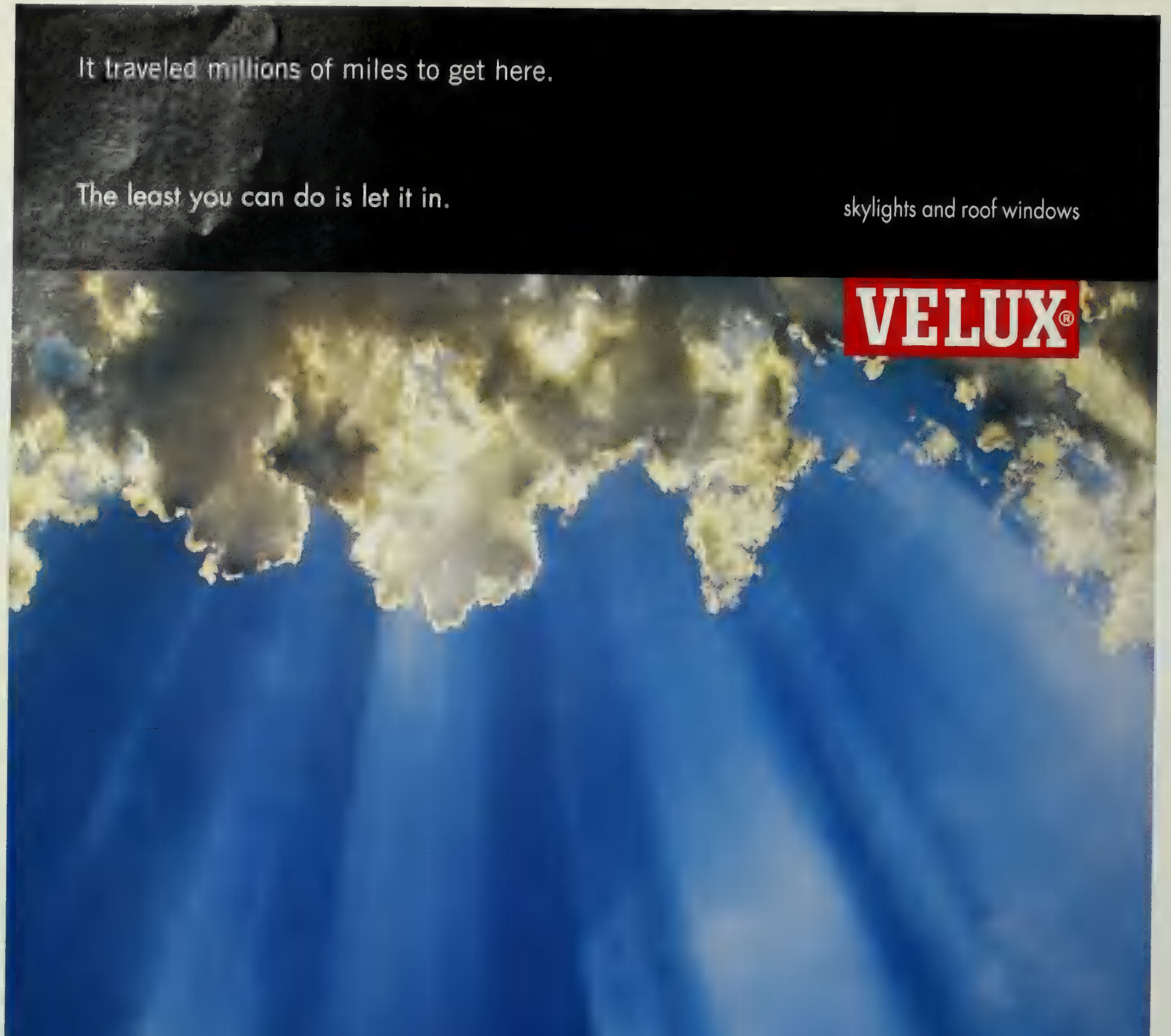
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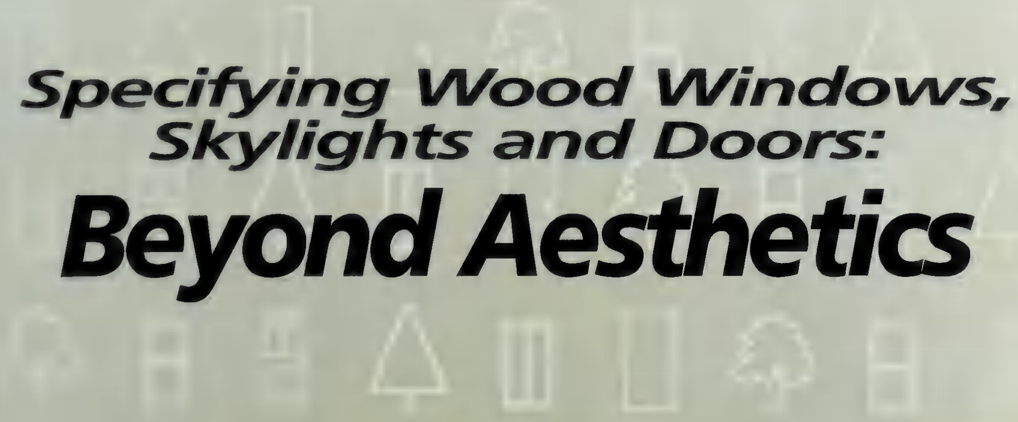

# Specifying Wood Windows, Skylights and Doors:

# Beyond Aesthetics

Often the inclusion of wood windows, skylights, and doors in a building project is an obvious choice. For what could be more traditional, particularly in domestic architecture, than a piece of wood, sized to cover an opening in the façade and shaped to hold panes of glass or designed to allow entrance into and out of the building. Task accomplished!

Yet, today we ask much more of our wood windows, doors and skylights—in commercial as well as residential projects. Aesthetics are high on the list, for few materials can match wood's natural beauty, as revealed in its texture, grain, and color. But, also of great importance are other qualities and characteristics that wood windows, skylights, and doors offer—energy efficiency, ease of accessibility, acoustical buffering, fire control, and even a responsible use of our natural resources. In some cases, new wood window, skylight and door components are designed to comply with ever-changing codes and standards. In other instances, the products may be of cutting-edge technology, leading the architect to a design standard beyond that prescribed by codes.

When specifying wood windows, skylights, and doors, architects, therefore, need to look beyond the aesthetics—to understand how other critical aspects of the occupant's safety and welfare are addressed. With this in mind, the National Wood Window and Door Association (NWWDA), in association with the AIA/ARCHITECTURAL RECORD Continuing Education Series, offers a brief examination of the effect on wood windows, skylights and doors of changing requirements in several different areas of concern—acoustics, the environment (including energy efficiency), fire safety (including positive pressure testing), and accessibility. Often developments in one area overlap into another, as wood windows and doors are integrated products. Finally, this compendium offers a look at four instances in which the inclusion of wood windows, doors, and skylights go beyond aesthetics.

The NWWDA is comprised of the country's leading producers of wood sash, frames, window units, flush doors, stile and rail doors, sliding and swinging patio door units, and skylights, as well as producers of the numerous other materials required to manufacture this industry's products. As a professional trade organization, it formulates and promotes high standards of quality for the industry. More information on NWWDA, its standards, procedures, and literature can be obtained from NWWDA, 1400 E. Touhy Ave., Des Plaines, Ill. 60018. (847) 299-5200. Or visit NWWDA's website at http://www.nwwda.org.

AIA / ARCHITECTURAL RECORD
Continuing Education Series

Use the following learning objectives to focus your study. After reading *Specifying Wood Windows, Skylights, and Doors: Beyond Aesthetics*, complete the questions (page 236) and check your answers (page 236). AIA members may fill out the self-report form (page 392) and send it in for two AIA Learning units that quality for Health, Safety, and Welfare credits.

**Learning Objectives:** After reading *Specifying Wood Windows and Doors: Beyond Aesthetics* and completing the exercises, you will be able to:

- Discuss at least two issues of concern in each of the following areas—acoustics, accessibility, environmental responsibility, and fire resistance.
- Discuss the theory behind acoustical, thermal, and fire performance tests and how to increase effectiveness in each area.
- Identify the nuances of specifying wood windows and doors in three different design applications.

# WHEN IT CAME TO RENOVATING THIS HISTORIC COURTHOUSE, EVEN THE

In 1964, The Parker County Courthouse in Weatherford, Texas was designated a Texas Historic Landmark. And thus began the slow, methodical process of restoring it. First to receive attention was the structure's limestone stonework. Later, the roof was replaced. Then came the windows, which proved to be one of the most challenging aspects of the project.

The Historical Survey Committee mandates that if nothing remains of a historic building's original windows, the new ones must be faithful reproductions, right down to the last detail. Since the courthouse's original wood windows had been replaced by aluminum ones some years back, that meant that all 105 of the new windows had to be virtually identical to those made and installed over a century ago.

Bids were sought, but only two manufacturers felt qualified to respond. One of them, Marvin Windows & Doors, had actually been recommended by a company that was asked to bid but declined.

Though underbid by the other finalist, Marvin's figures were based on building the largest windows with structural muntin bars to withstand the winds that buffeted the building's hilltop site. Intrigued, the architect asked each company to build a sample window. One look at the prototypes and the job was immediately awarded to Marvin.

For the next several weeks, Marvin's architectural department busied itself recreating the past. Working from turn-of-the-century photographs

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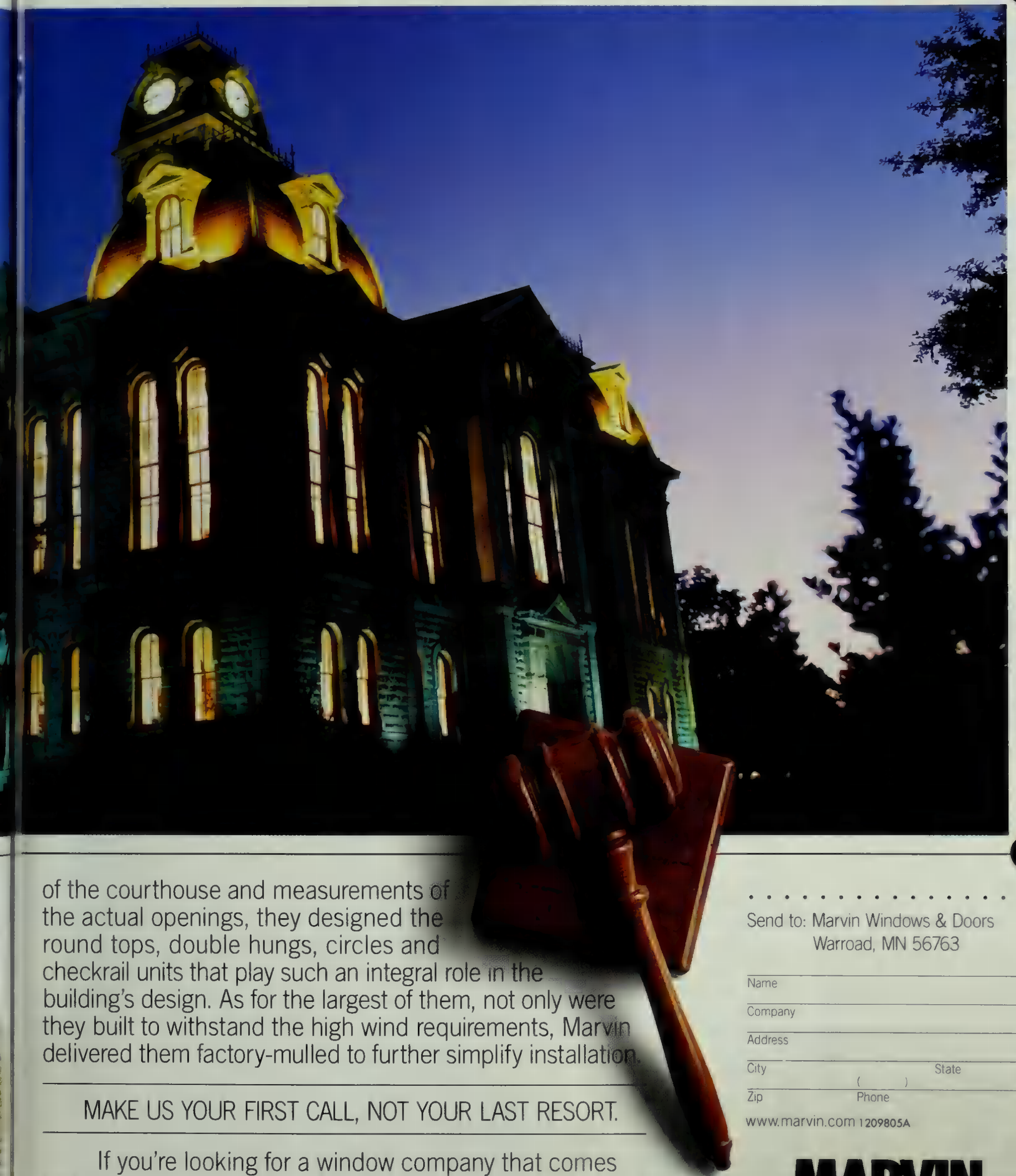

of the courthouse and measurements of the actual openings, they designed the round tops, double hungs, circles and checkrail units that play such an integral role in the building's design. As for the largest of them, not only were they built to withstand the high wind requirements, Marvin delivered them factory-mulled to further simplify installation.

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## Acoustics

As a natural material, wood ranks high in acoustical properties. Wood fiber contains many cells, each of which traps sound and decreases reverberation. The heavier the frame, the less sound transmission. Wood performs much better acoustically than metal, which provides a smooth avenue for sound transmission.

For wood products, further sound attenuation comes with special door construction. In the design of "acoustical" doors, wood veneer covers a core that has a damping construction to prevent the faces from vibrating in unison and also to meet special gasketing and automatic bottom requirements.

For wood windows and skylights, the glazing system primarily determines acoustical performance variations. Acoustical performance is rated by its Sound Transmission Class (STC), a measure of performance or transmission loss of a material or product over a standard frequency range. The frequency range is based on speech frequencies taken under laboratory conditions from 125 Hz to 4000 Hz and excludes both the lowest and highest frequencies.

Basically, greater mass generally results in less sound transmission. For example, a 13-mm (1/2-inch) thick piece of glass has a higher STC rating than 6-mm (1/4-inch) glass. Therefore, simple architectural applications might utilize single laminated glass with a polyvinyl butyral core 1.5 mm thick, which can provide an STC of up to 41. The highest possible STC level of 51 involves the use of 2 lites of 13-mm laminated glass or 6-mm laminated glass with a 100-mm air space between the lites.

It's important to note that the air space doesn't increase the mass. For example, is 2 lites of 6-mm glass with an air pocket of 100 mm better than 2 lites of 13-mm glass laminated together? The 2 lites of 13 mm would have greater mass.

The sound transmission loss of glazing can be improved by:

- Using insulated (double) glass with a minimum 13-mm air space, and with different glass thickness.
- Increasing the thickness of the glass (up to 13 mm).
- Using laminated glass, which can achieve higher STC ratings than monolithic glass of the same thickness.
- Avoiding lightweight frames. (Use separate frames where possible, and line the interior perimeter of frames with sound absorbing treatment.)
- Mounting glass lites with soft neoprene edge gaskets rather than putty or caulking.
- Using sealed rather than operable windows where possible. Where operable windows are required, double windows with separate sashes should be used rather than a single sash with double-glazing.

## Environmental Concerns

Environmental concerns including important societal issues such as pollution, energy efficiency, and renewability are not normally addressed by building codes but are more likely addressed as industry standards.

**Energy Efficiency.** As a natural material, wood ranks high in thermal performance. It's the same natural design that offers acoustical buffers—wood fiber contains many cells, each of which traps air and creates natural insulating pockets throughout the whole mass of wood. The principle is the same one that is used in insulated glass systems. It's the trapped air, not the glass, that provides the energy benefits. Tests show that as an insulator, wood is 4,000 times more efficient than steel and 1,800 times more efficient than aluminum. Wood windows, doors, and skylights require less energy consumption in the production process than those manufactured from fiberglass, plastic, steel, or aluminum-and with less pollution.

In the manufacturing of wood windows and skylights, the development of low-E glass coatings and low conductivity gas-filled insulating glass units drastically changed the market, allowing for much more energy-efficient wood windows with greater glazed surfaces. The U-value of a wood window unit or skylight—the measure of its efficiency—is clearly stated on the unit's label. This allows easy specification of the proper thermal properties for a building's microclimate.

U-values measure the amount of heat transfer that results from a temperature difference across a window. Typically, U-values range from 1.15 to 0.15—the smaller the U-value, the less heat transfer between inside and outside due to temperature difference. A window with a U-value of 0.30, for instance, loses half the amount of energy as one with a U-value of 0.60 under the same temperature conditions. In other words, the lower the U-value, the more energy efficient the window (see chart below).

The National Fenestration Rating Council has established a single testing and rating system for U-values, based on the performance of the product—windows, doors, and frames.

Wood doors offer important energy savings as well. Unlike hollow-aluminum, steel or hollow-vinyl doors, wood doors react very little to heat and cold. Steel, particularly, rapidly transmits heat. Studies show that the air infiltration rate of steel doors virtually doubles between 100 and 130 degrees F, while that of wood actually declines

### U-Values of Windows

| Type of Glass | Wood window (80%) glass | Metal window (80% glass) | |
|---|---|---|---|
| | | nonthermal break | thermal break |
| Single glass | 0.99 | 1.10 | — |
| Insulating glass (1/4" air space) | 0.55 | 0.70 | 0.58 |
| Insulating glass (1/2" air space) | 0.46 | 0.59 | 0.49 |
| Single glass with snug storm window (1" to 4" air space) | 0.45 | 0.60 | 0.50 |

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slightly because of its wood fiber cells.

Emphasis on a door's thermal performance is somewhat misplaced, though, as 75 percent of a door's heat loss occurs around its edges. Since air travels around an object rather than through it, most energy loss occurs between the door and the jamb and threshold as air infiltrates through cracks and gaps. Further energy loss is found between the jamb and the surrounding framework of the buildings. Manufacturers of wood doors, therefore, call for correct installation, quality weatherstripping and caulking around door jambs and brick moulds.

Examples of weatherstripping product enhancements and jamb liners for wood doors include:

- Mating together door weatherstripping and door sweep, which eliminates the need for corner pads in the most vulnerable sealing area of the door.
- Excluding the foam on the back of jamb liners, thus providing a seal between the side jamb of the door and the jamb line.
- Ability of weatherstripping products to take on new shapes or expand or contract, depending on weather conditions.
- Utilizing a multiple weatherstripping system that effectively minimizes air infiltration and energy loss. In this system, an adjustable jamb balance, made from extruded, impact resistant polyvinyl, is designed to resist conduction of warm air. A stepped gasket seal at the sill and side jambs virtually eliminates the possibility of water penetration.

**Responsible use of natural resources.** Wood can be considered an environmentally friendly resource in that it is renewable, recyclable, and ultimately biodegradable. Today's responsible forestry practices add to its environmentally friendly status. Most manufacturers utilize certified, well-managed forests for their raw materials. There, forestry experts ensure that the lumber supply is being replenished at a reasonable rate.

Recycling is also evident in the manufacturing of wood windows, skylights, and doors. For instance, many manufacturers use finger-jointed stock for components of frame and sash construction of windows, doors, and skylights that are hidden from view. Finger joining permits the use of smaller pieces of wood that have been discarded or burned in the past because of a defect, such as a large knot, and produces a structurally strong component.

A more sophisticated engineered wood product is produced by laminating multiple veneers with phenol-formaldehyde resins into large billets, which are then milled to size. The result is a structurally strong material used in door stiles and other large span or heavy load applications and hidden from view. In like fashion, wood composites combine wood fibers and various types of resin or plastic into composites and are known as "structural composite lumber," "laminated veneer lumber," or "parallel strand lumber."

**Factory finishing.** The finishing of wood doors, skylights, and windows in the factory reduces the potential of accidents associated with using environmentally hazardous materials on site—and may result in a better looking product. At the factory, conditions are ideal; in the field, job conditions often cannot be controlled. Factory finishing actually can prove less expensive and result in better finishes. And if a spill occurs, it can be better controlled.

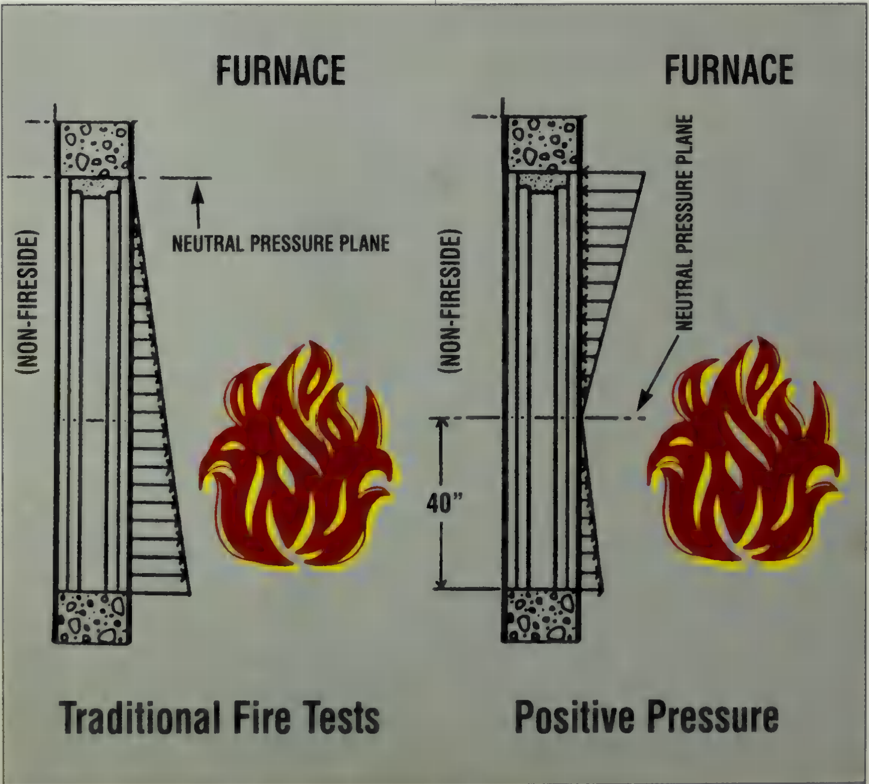
## Fire Resistance

*(Including Positive Pressure Testing)*

Over the years, the manufacturers of wood doors have responded to consumer demand for fire safety by developing four classifications of fire-resistant wood doors. In turn, the model building codes have established a fire-door rating system for use in protecting door openings in fire-resistance-rated walls. As such, all fire-resistance-rated doors must meet the requirements of ASTM E152 and bear certifying labels of an independent testing agency approved by the building officials. Installation of fire-resistant wood doors must be in accordance with the National Fire Protection Association's Publications NFPA 80 "Fire Doors and Windows" and NFPA 101 "Life Safety Code."

Core construction for 45-, 60-, and 90-minute doors is a mineral substance with a chalklike consistency. The basic 20-minute wood fire door accounts for about 90 percent of the market today.

Likely, controversial changes in fire door construction will result from the adoption of positive pressure testing by



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one model code organization—ICBO. (This provision in the Uniform Building Code is a model for local jurisdictions that ultimately must adopt the language into its code.) Developed to more accurately reflect real-world situations, the new test specifies that "after five minutes into the test, the neutral pressure level in the furnace shall be established 40 inches above the sill. Such pressure shall be maintained during the entire test period."

Previously, the neutral pressure plane was maintained at the top of the door for the entire test. The new test calls for hot air to be held against the top two-thirds of the door, while the lower one-third would have cooler air drawn into the furnace. The positive pressure tends to make the flames and hot gases want to push through the door, which is already weakened. The test is designed to reflect real situations based on the theory that heat expands the air, increasing the air pressure in the room or space where the fire is.

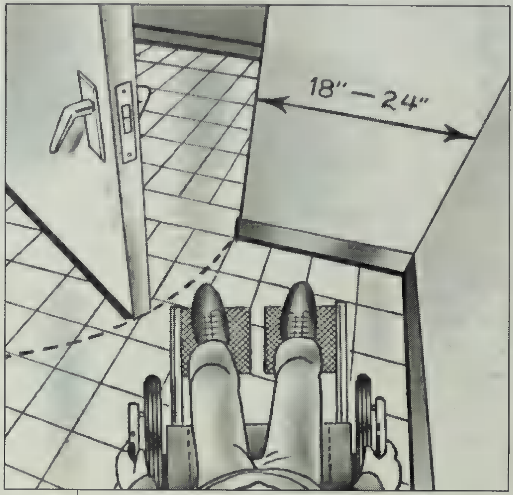
It is uncertain how wood door products will be affected by positive pressure testing, but industry experts suggest the new testing procedure will likely affect the design of the entire door system, including the frame and hardware design.

## Tips on Hardware Selection

As mentioned above, in the aftermath of the ADA, there has been a major shift from doorknobs to levers and a slow movement toward electrified hardware, such as electric strikes or electromagnetic locks. Beyond accessibility, hardware selection is key to providing egress and security. Compatibility of the wood door, skylight, or window and hardware is important. Often overlooked and sometimes underrated, locksets, closers, and exit devices are integral components of wood windows and doors. Hardware has to work well with a wide range of windows, skylights, and doors in order to meet building codes. And, increasingly, form has to meld with function. The trend is to meet consumer demand for hardware that is stylish, or that is virtually invisible, such as concealed hinges and handles.

## Accessibility

Adopted by the U.S. Congress in 1990, the Americans with Disabilities Act (ADA) has had far reaching consequences on building codes. The intent behind the law is that persons with disabilities have the right to receive the same public services and opportunities as nondisabled persons, including access to and through public buildings. For wood windows, skylights and doors, concerns center on the ease of mobility through doors and of operating both doors and windows.



The most basic requirement is that doors are wide enough for a wheelchair-bound person to swing the door open without hitting the chair and allow him or her to maneuver through the doorway. With standard construction and tolerances, a 36-inch width is the narrowest a door can be to comply if standard hardware is used.

When complying with accessibility standards and codes, though, much more than just the width of a wood door opening needs to be considered. For instance, door stops and thresholds can prove hazardous. Kickplates can also prevent the damage sometimes inflicted onto doors by wheelchairs.

The type of door used for each building should be carefully considered. Wood sliding doors are often used, but may prove daunting to an older person. Special gliding tracks and other upgrades can make them easier to open. Some wood sliding doors have been newly designed to move without strong effort. Wood swinging doors are the most popular, but require landings on both sides (and these landings must have 18 to 24 inches of clearance beyond the strike jamb to allow enough room for a wheelchair user to easily open the door.) Wood pocket doors can be attractive when privacy is only occasionally wanted. Swinging wood patio doors are becoming popular as well, as they allow users to operate the somewhat larger units like a door, rather than having to slide them from one side to another. To enhance accessibility, automatic operators are now commonly used on exterior and vestibule doors.

For windows to be considered accessible, the ADA specifies that "windows requiring pushing, pulling, or lifting to open should require no more than five pounds of force to open or close." Wood tilt windows offer easy operation. Also highly useable by disabled persons are wood window systems that can be operated electrically. Motorized windows eliminate the difficulties associated with operating standard crank handles.

The American with Disabilities Act has also had a tremendous impact on what is currently available in door and window hardware. According to the ADA, handles, pulls, latches, and other operating devices on accessible doors "shall have a shape that is easy to grasp with one hand and does not require tight grasping, tight pinching or twisting of the wrist to operate." In other words, lever-operated mechanisms, push-type mechanisms and U-shaped handles are acceptable designs.

To be truly accessible, latches and locks need to be within reach of a person seated in a wheelchair or no higher than 48 inches above the floor. Since the hardware should be easy to operate, lever handles on latches and slide bolts instead of dead bolts are preferred. In fact, lever handles are considered the most easily used by the disabled. Concerning door locks, a concealed vertical rod design that attaches to the locking edge of a door and retracts the bolts into the core of the door is available. Swing-clear headings are also a good idea, since they effectively widen the door opening 1 1/3 inches by removing the door completely from the opening.

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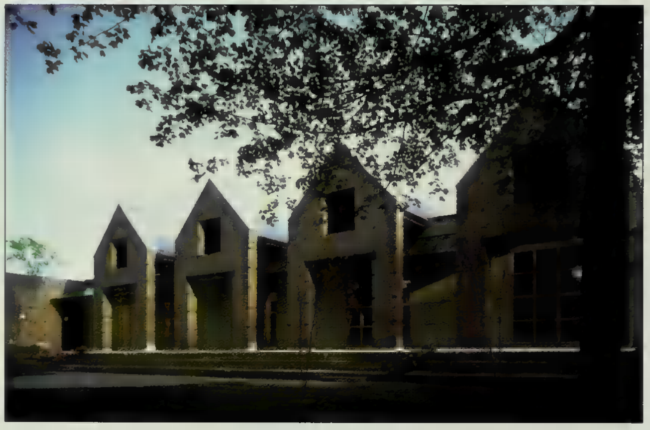
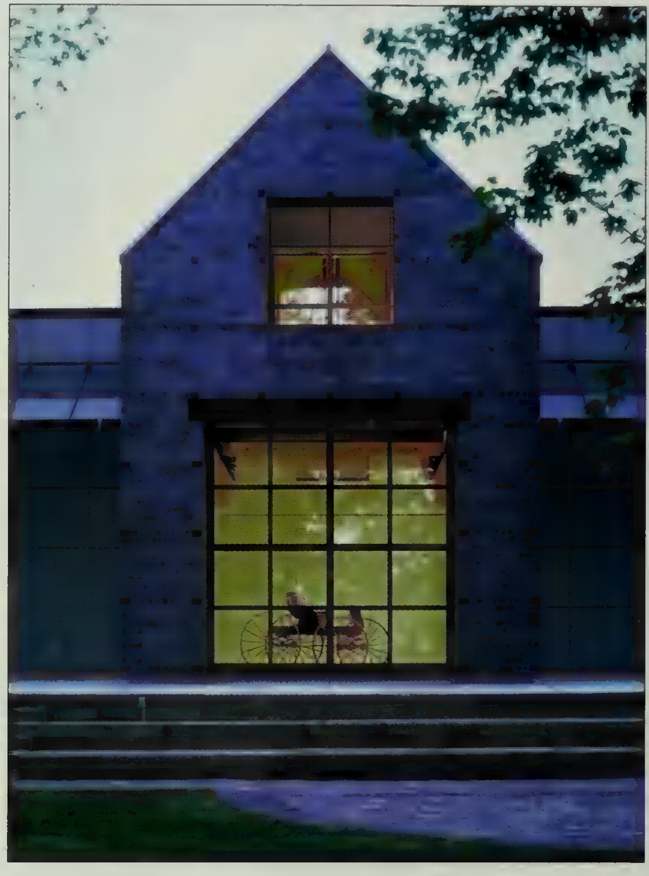
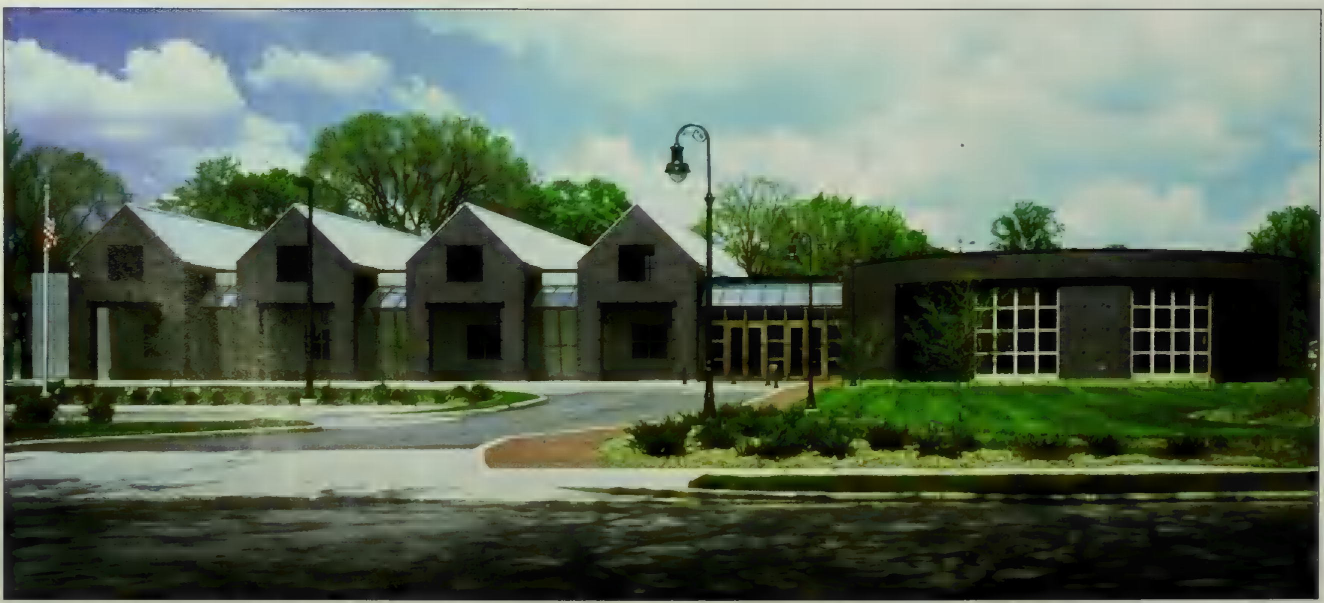
**Wood Windows and Doors Heighten a Sense of Warmth and Accessibility in Health-Care Facilities**
Ellerbe Becket uses wood windows and doors liberally in three health-care facilities to add a domestic quality to the institutional aesthetics (clockwise, starting top): WestHealth in Plymouth, Minn; and North Memorial Medical Center, Robinsdale, Minn.; and Memorial Deaconess Medical Center, Billings, Mont.

## Concern for Energy Efficiency, Accessible Egress Prompts the Use of Wood Windows and Doors

Showcasing the historic artifacts of Northern Indiana, the 43,000-square-foot History Center of the Northern Indiana Historical Society in South Bend, Indiana, combines wood windows and doors to aesthetically contrast with masonry walls, while at the same time meeting energy efficiency and accessibility requirements. The center was designed by Holabird & Root.







For 85 years, children with dreams of performing have attended the renowned Perry-Mansfield Performing Arts School and Camp. Now the oldest, continually-operated dance and theatre camp in the country, its distinguished alumni include: Doris Humphrey, Merce Cunningham, Agnes de Mille and Dustin Hoffman.

"The Pavilion", a focus of great pride for the school, was designed with wide, open-air spaces and symbolizes life's essentials: a person, the land, and the sky. Expansive walls of hinged patio and sliding doors frame the structure, and windows with small, divided-lite patterns represent trees and leaves.

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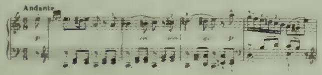

Michelangelo transformed an entire ceiling.

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## AIA/Architectural Record Continuing Education

The proceeding article *Specifying Wood Windows, Skylights, and Doors. Beyond Aesthetics*, provided by the National Wood Window and Door Association, is part of the AIA/ARCHITECTURAL RECORD Continuing Education Series. You can receive 2 continuing education learning units that qualify for health, safety and welfare credits by reading the article, studying the learning objectives and answering the questions below. Turn the page upside down to check your answers. Then return the self-report form as indicated on page 392.

## Learning Objectives

- Discuss at least two issues of concern in each of the following areas—acoustics, accessibility, environmental responsibility, and fire resistance.
- Discuss the theory behind acoustical, thermal, and fire performance tests and how to increase effectiveness in each area.
- Identify the nuances of specifying wood windows and doors in three different design applications.

## QUESTIONS

**I.** What steps can be taken to increase the acoustical properties of wood windows, doors, and skylights?

**2.** Describe the National Fenestration Rating Council's rating system for energy efficiency in windows?

**3.** As 75 percent of a door's heat loss occurs around it's edges, name four methods to decrease the air infiltration around a door.

**4.** List the two ways in which the manufacture of wood windows, doors, and skylights shows a responsible use of natural resources.

**5.** What is the theory behind new testing requirements for fire resistance through positive pressure testing?

**6.** How has the design of wood windows and doors been modified to comply with the requirements set forth in the American with Disabilities Act?

## ANSWERS

**1.** Greater mass results in less sound transmission. Therefore, the transmission loss of glazing can be improved by increasing the thickness of the glass, and using laminated glass. Avoid light weight frames.

**2.** NFRC has established a system of U-values, which measure the amount of heat transfer that results from a temperature different across a window. Typically, U-values range from 1.15 to 0.15—the smaller the U-value, the less heat transfer between inside and outside due to temperature difference.

**3.** Mate together door weatherstripping and door sweep, exclude foam on the back of jamb liners, use weatherstripping products that can change shape according to weather conditions, or use a multiple weatherstripping system.

**4.** Ecosystem protection has been enhanced by the practice of obtaining wood from "certified, well-managed" forests. What was previously considered waste wood byproducts are now being recycled into composites and used as hidden components of windows, skylights, and doors.

**5.** The positive pressure test is designed to reflect real situations based on the theory that heat expands the air, increasing the air pressure in the room or space where the fire is. The new test specifies that "after five minutes into the test, the neutral pressure level in the furnace shall be established 40 inches above the sill."

**6.** The most basic requirement calls for doors to be wide enough for a wheel-chair bound person to swing the door open and maneuver through the doorway. Windows are to require no more than five pounds of force to push, pull, or lift.

For self-report form, turn to page 392.

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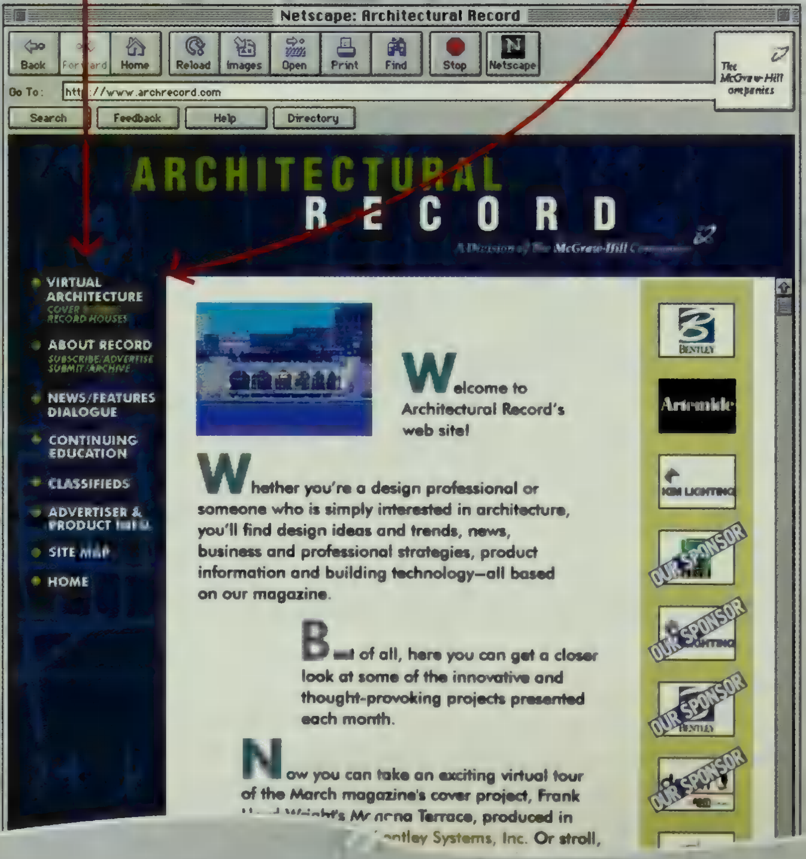

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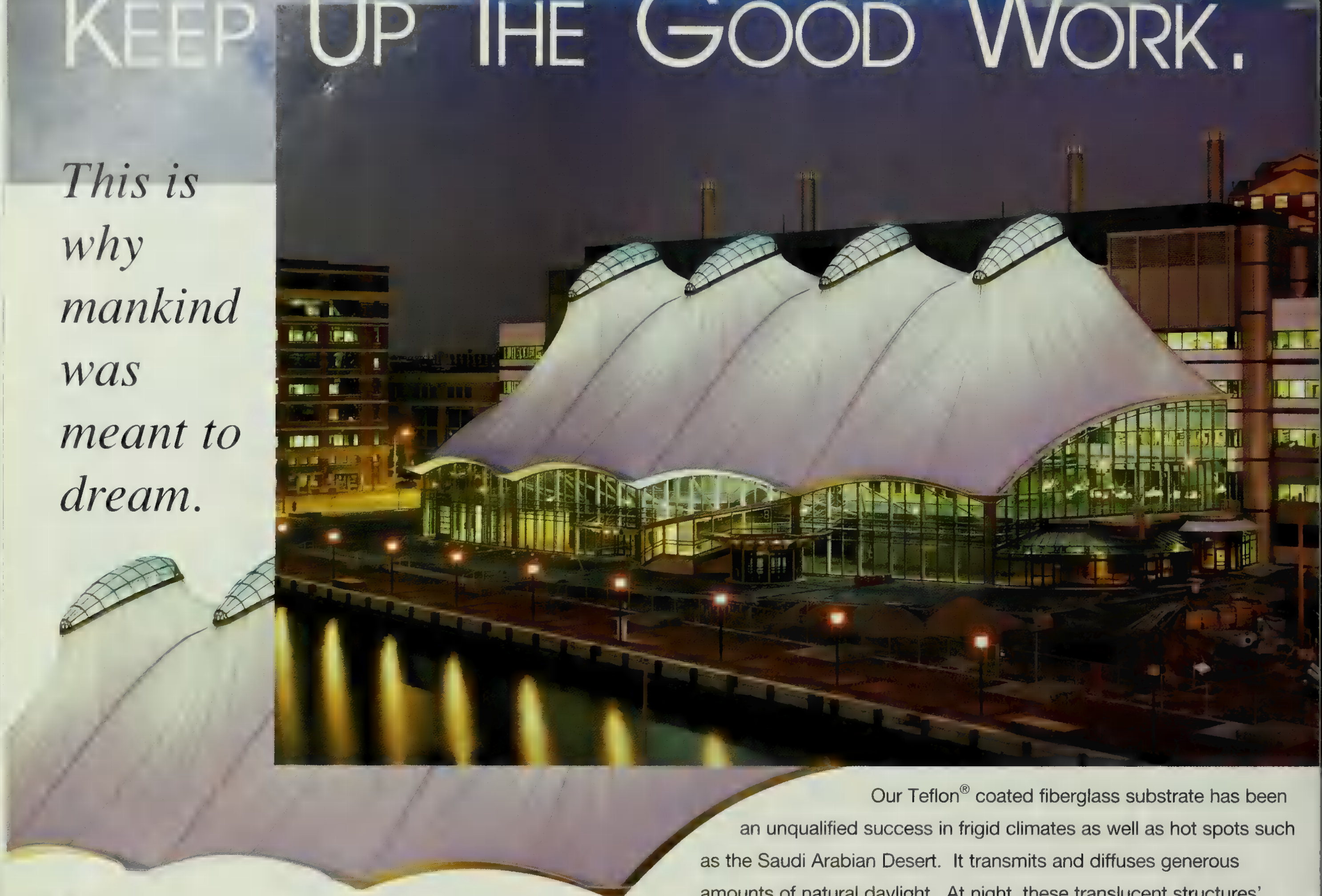

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# Building Over, Around, and Through

## FOR BUILDINGS ON DIFFICULT SITES, WHERE THE LOGISTICS OF THE CONSTRUCTION PROCESS MAY DRIVE THE DESIGN, ARCHITECTS' SKILLS MAY BE PUT TO THE TEST.

**by Virginia Kent Dorris**

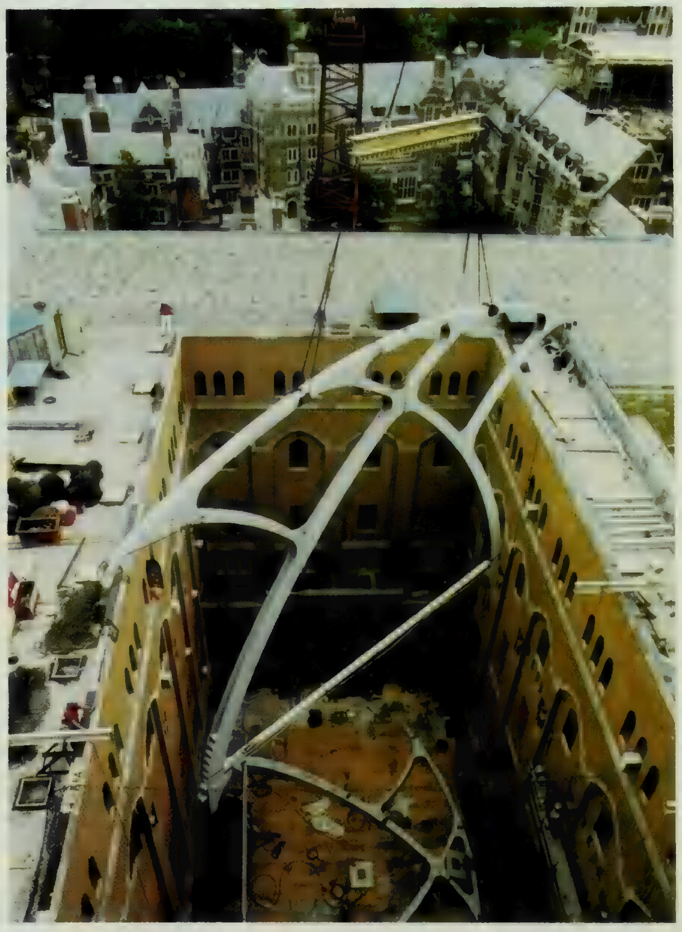
It is not unusual for an architect to be asked to build an addition to existing buildings on a dense, urban hospital campus. The tenor of the assignment changes, however, when making the connection means spanning a 100-foot-deep ravine with a critical access road at the bottom. The complex logistics of building on such sites are driving a widening variety of medical, research, academic, transportation, and other projects. In seriously circumscribed settings, planning for how the building will be built—including the phasing of construction, the coordination of trades, and the maintenance of existing building services during construction—starts early in the process and significantly affects the final design.

Where clients have a high investment in an existing location, moving to an open site that is easy to build on may be out of the question. While redoing a surgical wing can cost $100 million, replacing a major research hospital can run $1 billion; renovating an airport terminal may run $200 million; building a new major airport can easily run $10 billion. When owners must make the most of their current facilities, architects are called on to design structures—often complex, difficult, highly technical new buildings or additions to existing buildings—that fit over, under, between, or through existing facilities.

Coordination among the members of the building team is much more demanding than on conventional projects and demands management and communication skills that are not part of many architects' training. The design and construction team may be large, including architects, engineers, contractors, construction managers, subcontractors and specialized consultants, client representatives, and user groups.

But even when a project might legitimately be viewed as a logistical nightmare, architects caution, such concerns need not overshadow the pursuit of good design. "Logistical challenges are not an excuse for poor architecture," says Anthony T. Vacchione, Jr., AIA, director of airport planning and design at Skidmore, Owings & Merrill in New York City. He was project manager of the firm's extension of Dulles Airport's main terminal [RECORD, March 1997, page 62] and is currently designer of major additions at airports in New York City and Toronto. "The challenges cause you to think harder. You need to use the constraints to your advantage in shaping the building," he says. Gene McGovern, president of Crow/Jones Construction and a 25-year veteran of building international mega-projects, including Canary Wharf in London and the Petronas twin office towers in Kuala Lumpur, explains, "When you look at what drives logistically complex projects to success, it is getting the team together as early as possible, bringing together the architects' knowledge of planning and design and the contractors' knowledge of construction methods and sequencing."

*Virginia Kent Dorris, based in Brooklyn, New York, writes on architecture and architectural technology.*



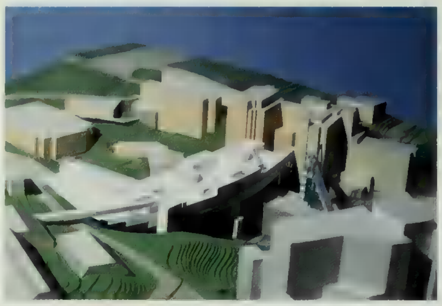
**Shepley Bulfinch Richardson and Abbott designed a neo-Gothic truss for a Yale library with an eye to installation logistics.**

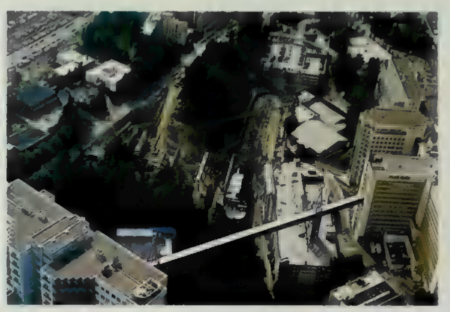
PHOTOGRAPHY: © WOODY FORD

The architect's communication and management skills may be put to the test during the execution of these difficult projects. When an owner hires a contractor or construction manager during the early phases of design to provide guidance on constructability and cost, the traditional architect/client relationship is altered. Because the contractor communicates directly with the owner regarding design decisions, the architect may feel his or her role diminished. The architect may also feel burdened by the need to continuously balance the requirements of various parties, with their sometimes competing interests, during design.

Conversely, the architect has much to gain from the arrange-

At the Doernbecher Childrens Hospital, Zimmer Gunsul Frasca's design spans a ravine over an active road and a parking structure that has remained in operation throughout construction. The photo sequence shows how the design minimized foundations and scaffolding on the steep, unstable hillside. The builder had to carefully place cranes around the busy roadway below. Steel framing speeded construction.





ment. Often the architect can tap into the contractor's vast knowledge of construction means and methods in a way that might not otherwise be possible. In addition, the need for late changes to the design can be minimized. The concrete, problem-solving knowledge gained by the architect may not only improve the project at hand but also give the architect an advantage in approaching future complex projects.

## Hospital as highway bridge

When architect Zimmer Gunsul Frasca was hired by the Oregon Health Sciences University to design a new children's hospital on its medical campus in Portland, the exact site for the $61 million, acute-care facility had not been chosen. Few open sites remained on the hilly, 116-acre campus, shared by three hospital systems on a ridge above Portland's central business district. The hospital wanted an aesthetically unintimidating facility with easy access to an existing neonatal intensive-care unit and imaging facilities located near the center of campus. Cost was also important: the state-owned hospital system planned to finance the new building largely with private donations. After examining all options, the architect and client decided to locate the new Doernbecher Children's Hospital some 100 feet in the air, over a ravine. The decision created logistical challenges that influenced the form and materials of the new hospital building as well as how the architect worked with members of the building team.

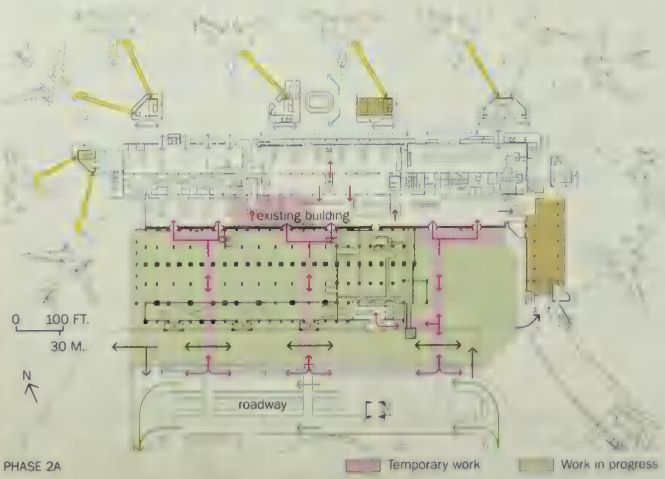
From the start, the Oregon Health Sciences University (OHSU) sought a team approach to the design and construction of Doernbecher, explains Gordon Ranta, director of special projects for OHSU. Rather than accept the traditional design-bid-build contractual relationship usually required for public projects, the hospital approached the state for permission to use a private-sector-style negotiated contract employing a construction manager/general contractor for the job. With timely sequencing and attention to accessibility critical during construction, the low-bidder procurement of the general contractor required by most public agencies would have precluded critical dialogue between builder, architect, and owner. And it may not have identified a contractor with the unusually high management skills needed. "We thought it was critical to get the construction manager in on the design in terms of constructability and cost," says Ranta. Lawmakers acceded; Portland-based Hoffman Construction was hired early (using a qualifications-based selection process), developed a guaranteed maximum price, and began working with Zimmer Gunsul Frasca during schematic design.

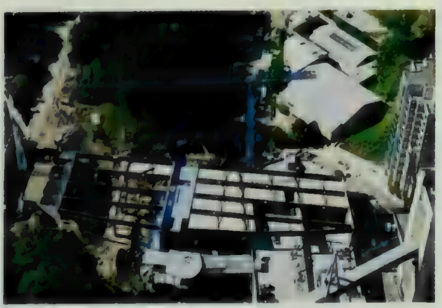
The logistical challenges associated with the project were not restricted to building 100 feet up. The site was also bisected by a road that had to remain open. Also located in the ravine was a parking garage that compounded the problem: the owner demanded that it operate throughout construction, even as contractors drove 96 piers through it to support one end of the new hospital building above.

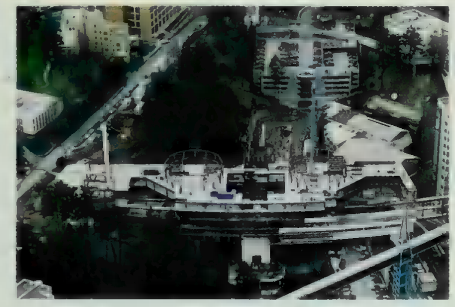
Jan Willemse, project architect and Zimmer Gunsul Frasca associate partner, initially envisioned the building with unsupported spans of some 150 feet, literally bridging the ravine. He ultimately reduced the span length to an average of 70 feet when it became clear that the large structural members required to achieve the long spans could not be transported to the site over narrow, winding access roads. Fabrication of the members on site was also deemed undesirable. "Although we were hoping for long clean spans, it was a matter of aesthetics versus constructability," says Willemse. "In the end, we felt that the building form was strong enough to carry off the appearance of spanning the ravine, and that our choices didn't compromise the aesthetics in any significant way."

Likewise, design of the new hospital's structural system was constrained by the site. To avoid the extremely difficult job of mounting

The middle three of seven construction phases are shown for SOM's Logan Airport Terminal E (right). Computer files are layered so that toned areas denoting the scope of each phase can be changed throughout all plans. Phasing considerations had to include passenger comfort, security, and wayfinding as well as construction logistics. A section shows the roadway at right (below).







scaffolding on the steeply sloping site, the architect and contractor opted for a steel structural system that could be erected by crane. At first the team considered trusses, but successfully adapted the support system to steel-plate girders when Portland-based Oregon Steel Mills and American Steel, a distributor, offered the components as an in-kind donation. (The child of the president of American Steel had been successfully treated at Doernbecher.) Extruded, hollow-core, precast concrete planks were laid between the girders. Their undersides were left exposed, which permitted the elimination of a planned metal soffit, saving time and money.

In the final design, the building is supported at roughly midspan by a poured-concrete elevator and utility core clad in stone and metal panel. Visitors and staff enter the core from the existing garage at a third-level lobby and travel by elevator to what is essentially a four-story hospital raised seven stories off the ravine floor. The new hospital connects to an existing building on the north edge of the canyon on levels eight and nine.

With much of the exterior hanging in the air, the design team selected the building's exterior cladding with an eye to maintenance. "If you have a problem with this building, it will be extremely difficult to go out onto the skin to correct it," Willemse explains. Though the medical campus consists mostly of masonry buildings, Willemse says he felt comfortable specifying metal panels because that system had already been introduced to the medical center in 1991 when the Casey Eye Institute was built nearby. ZGF specified a dry-joint, metal-panel curtain-wall system, which does not have exposed sealants that would eventually need repair or replacement. Another advantage of the metal-panel system was that it could be installed from a swing-stage platform suspended from the new structure itself, further reducing the need for scaffolding.

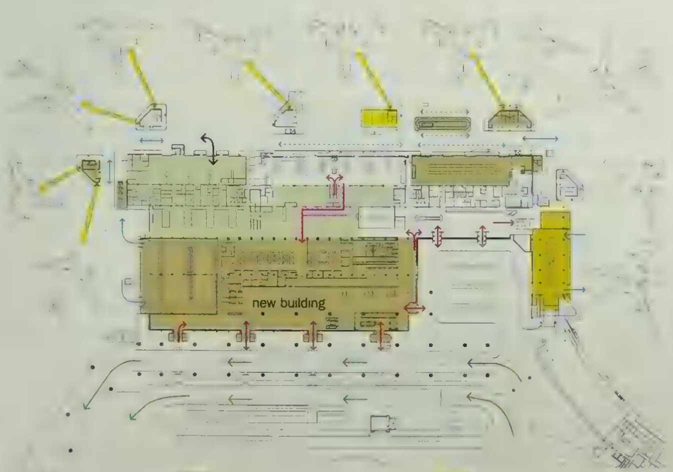
Bill Forsythe, project manager for Hoffman Construction, recalls that he and Willemse collaborated to write highly detailed subcontractor bid documents. They defined limits of work with significant input from the architect and engineers to help ensure that construction would proceed smoothly. "It was a hand-in-hand approach to design and construction phasing," says Forsythe. The building is nearing completion, and will open this summer.

### Traumatic construction

HDR Architecture, the Omaha, Nebraska–based designer of an $18 million addition to a trauma center at Methodist Medical Center in Dallas, is also dealing with constraints that influence both design and construction. The five-story addition, just beginning construction, will be built on an irregular site surrounded on almost all sides by existing hospital buildings of various heights and ages. The adjacent, existing emergency-room area must remain open and fully accessible throughout construction.

Careful phasing and planning will be required to build the addition without shutting down vital services, says Philip Wendling, AIA, HDR project principal. According to John Dalzell, director of construction for the privately owned Methodist Hospitals of Dallas, at the start of the project Jirousek & Jirousek—a specialized health care firm headed by architect and nurse partners James and Josephine Jirousek—was retained to help site the building functions in relationship to existing functions. Dalzell, who has a construction background, developed a preliminary project-phasing plan before hiring HDR. The architectural design process was about half finished when the contractor, Austin Commercial Inc., in Dallas, was hired to build the project under a negotiated contract for a guaranteed maximum price.

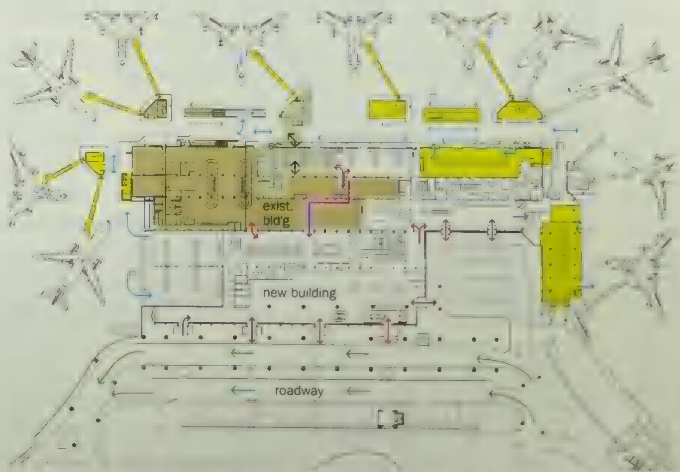
The extremely confined building site, and the lack of a nearby open area for storing building materials, posed the greatest coordination challenges. Trucks transporting materials can approach the site only one



PHASE 3A

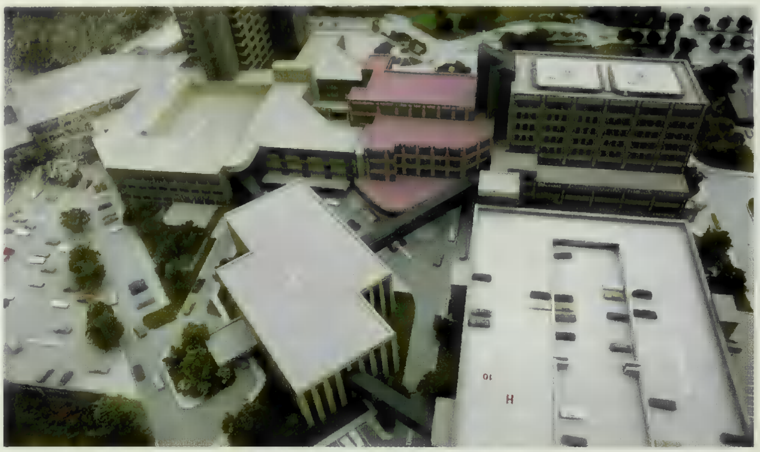
▨ Work completed this phase

🟨 Work completed previous phase

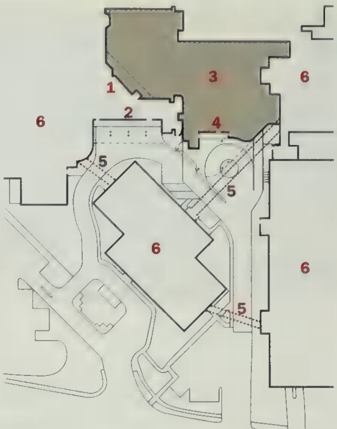


PHASE 4

→ Ped. circ. → Pass./comm. veh. → Serv. veh. → Const. veh.



No ambulance can be denied access during the construction of a new trauma center at the Methodist Medical Center of Dallas, designed by HDR.



SITE PLAN

1. *Existing entrance*
2. *Existing emergency*
3. *New addition*
4. *New entrance*
5. *Bridge overhead*
6. *Existing building*

at a time because of limited space, and they must back in. A one-level parking garage initially located under the new addition and extending beyond the new emergency room entrance to the south had be scaled back by about 10 percent because the space it would have occupied was needed for an access road. The building team is still examining the best way to maintain operations of two medical helipads located atop a 10-story building adjoining the addition because the pads may be affected by the proposed location of a major construction crane.

Planning the interior spaces of the first-floor trauma center and second-floor heart-treatment center were not affected significantly by site conditions, says Bernard Bortnick, FAIA, design director for HDR's Dallas office and project designer. But he regrets that the cramped site and budget considerations did not allow him to include additional amenities for patients, such as an outdoor garden or courtyard. Instead, Bortnick's design brings in light through a glass-block wall on the first floor and strategically placed windows on the second-floor patient rooms.

**AT LOGAN, WHERE THE CONTRACTOR HAS YET TO BE SELECTED, SOM WORKS WITH 20 OF ITS OWN SUBCONSULTANTS AND WITH TWO OWNER ENTITIES.**

### Library within a library

Architect Shepley Bulfinch Richardson and Abbott faced a logistical challenge more or less of the firm's own making during the design of a new music library for Yale University. The facility, which is nearing completion, is being constructed within an enclosed, 50-by-80-foot light well inside the university's largest library, the 4-million-volume Sterling Memorial, a 1930 Gothic-style stone building designed by James Gamble Rogers.

Jonathan Ross, AIA, project manager and principal at Shepley Bulfinch, explains that his firm began working with Yale in 1991 to create a master plan for the renovation of Sterling Library, undertaking an analysis of its condition and developing strategies for improvement. The architect concluded that a large internal courtyard could be enclosed to provide more usable floor space. Meanwhile, the university had been looking for 20 years to find a better home for its inadequately housed music library. In 1994 Ross received a telephone call from a librarian who had read the architect's report and wondered if the music collection could find a home in the courtyard.

The courtyard did indeed become the best location for the music collection, and so began the design of a library within a library. Early in the process, Ross envisioned a grand space containing a reading room, echoing the grand reading rooms created more than half a century earlier by Rogers within Sterling. Ross developed the new facility on three levels, at the base of a space that soars 60 feet to a new roof, which is supported by custom-designed, Gothic-inspired steel trusses. Patrons enter the music library on its middle level, near the circulation desk of Sterling. From that main level, which accommodates most library services and a record-listening room, patrons have access to the mezzanine level that overlooks it, housing the reference and periodicals reading room. The music library's basement level contains the collections, as well as reading carrels.

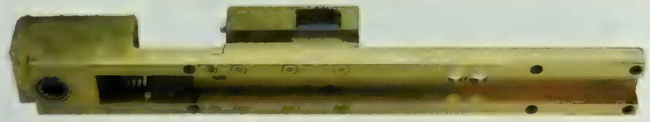
Since Sterling is Yale's main library, it had to remain open during construction, explains Alfred Dionne, executive vice president of Barr and Barr, the construction manager hired for the project. During construction, materials were brought in and out of the building through a window on a conveyor belt, raised on scaffolding, that hovered near the ceiling above an active library corridor. Concrete was lifted in buckets up and over the existing building by a 300-ton crawler crane. Erection of the 12-ton roof trusses posed a major challenge. Because the trusses were too large to be assembled outside the building and lifted into place, the team developed a plan to lift them in sections up and over the building, bolt them together on the new library's floor, then lift them into position.

The architect developed a plan that allowed the trusses to be fastened into the existing structural columns supporting what had been the exterior walls of the court. Operable windows, which formerly looked into the court, now look into the music library's reading room. Those windows still receive indirect light from the inserted structure but have been permanently sealed in compliance with fire regulations. Despite the logistical challenges of the project, Ross likens it to "putting a Swiss watch into a light well."

### Building a new airport around an old one

Keeping a busy airport terminal at Logan International Airport in Boston operating during construction of a $250 million expansion that will nearly double its size is the challenge facing the New York City office of Skidmore, Owings & Merrill. "At the end of the project, the beauty of the airport will be in the architecture, but the beauty of what we do will be keeping the airport functioning throughout the construction," says Walter

# Ellison's Balanced Door.
# Greater Than The Sum Of Its Parts.


*Cast bronze check and door guide assembly*

+

*Cast bronze top pivot with bearing*

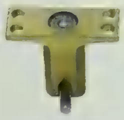
+

*Torsion bar closer spring*

+

*Cast bronze bottom arm*

+


*Cast bronze semi-automatic hold open device*

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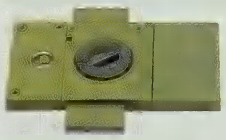
*Cast bronze floor box*

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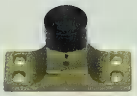
*Cast bronze door roller guide*

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*Cast bronze door bottom pivot*

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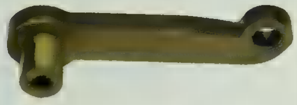
*Cast bronze top arm*

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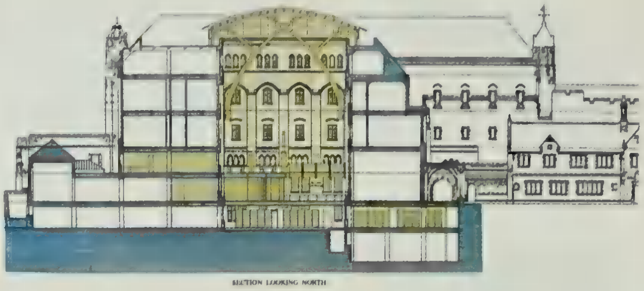
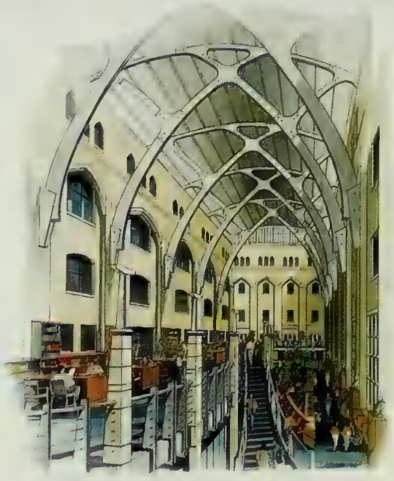




**Yale University is filling a courtyard in the 1930 James Gamble Rogers Sterling Library with its music collection. Shepley Bulfinch Richardson and Abbott's design allows indirect light (above). The neo-Gothic trusses were designed in components that could be bolted together at the base of the court.**

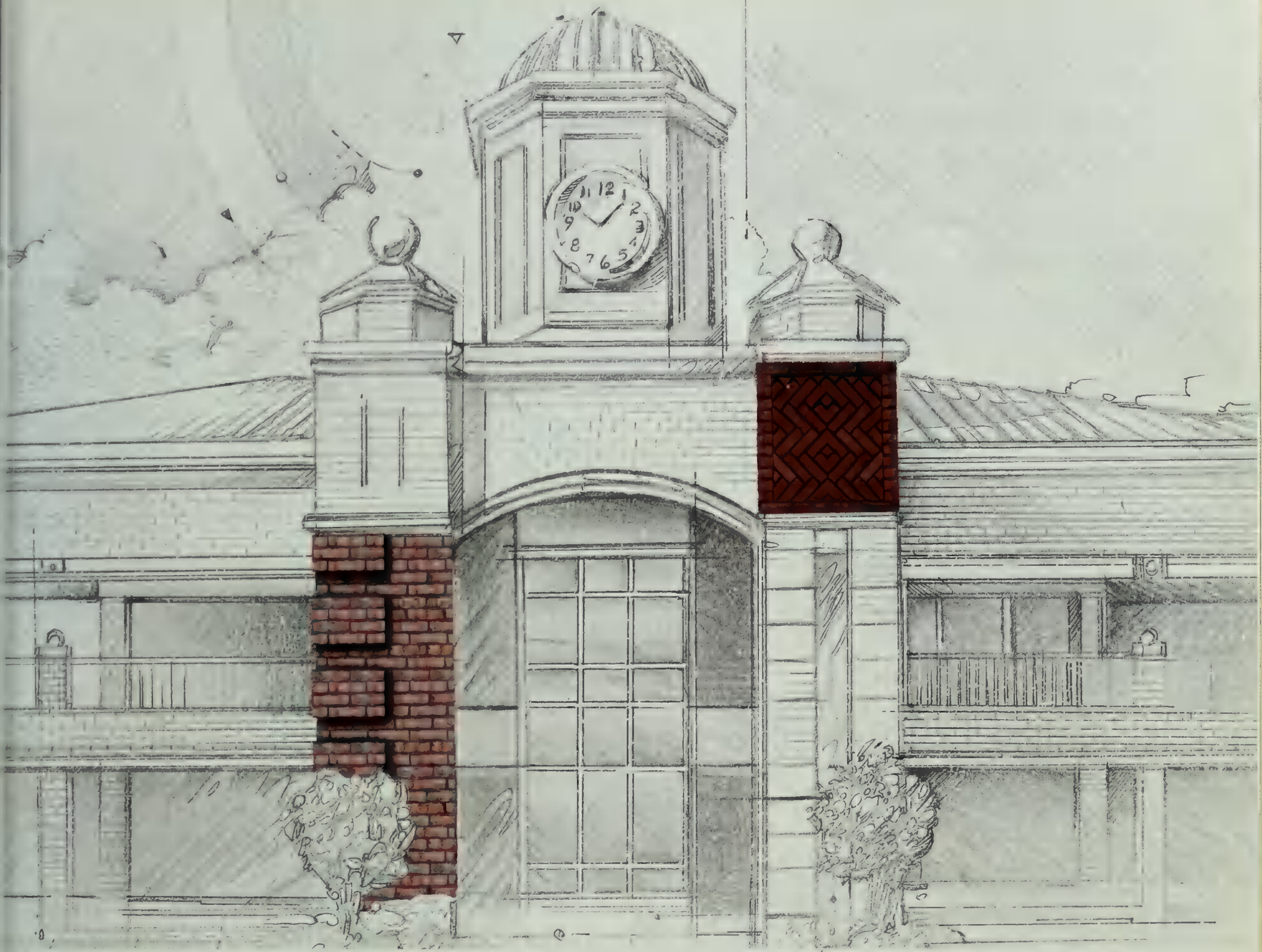
Smith, AIA, senior designer on the project. Coordinating existing operations was a concern from the very start, says SOM's Vacchione. He recalls a weekend-long charrette three years ago in Boston with the project's construction manager, a joint venture of Stone & Webster and Day & Zimmerman, where the team worked out a conceptual design and phasing plan together. "Work on the phasing started on day one," says Vacchione.

Expansion of the international terminal, known as Terminal E, is just one part of a $2 billion renovation of the entire airport. When originally designed by architect Kubitz and Pepsi in 1971, Terminal E was intended to handle just 600 passengers per hour during peak travel periods. The remodeled terminal will be designed to handle more than 3,000 passengers per peak hour after construction is complete in 2000. SOM is working closely with 20 subconsultants, ranging from the usual structural engineers to baggage-handling-equipment designers. The project construction manager works with Logan 2000, an entity merging Massport, the airport's owner, and O'Brien Kreitzberg, the terminal-area projects coordinator. Dan Coffee, a construction manager with Stone and Webster, says the team has worked to make the drawings as "ironclad" as possible because the contractor who will build the project is not yet on the job. The entire facility must be publicly bid, according to Massachusetts statute, and separate bid packages must be devised and bid for such subcontracts as glass and glazing; unit masonry; waterproofing and sealants; electrical; and mechanical. Communications, says SOM senior technical coordinator Mark Igou, AIA, "is a massive issue."

Available space for new construction is extremely limited on the congested airport site. SOM could not expand the building to the north, east, or west because it would impinge on existing aircraft taxiways and gate areas. As a result, it was necessary to expand the terminal to the south, essentially removing the building's landside facade, doubling the depth of the building, and turning a single-level facility into three levels, including a new two-level roadway to separate arriving and departing passengers. The terminal must provide a connection to a new pedestrian-bridge system that links all the terminals, a project under O'Brien Kreitzberg & Associates' direction, and prepare the way for a monorail-type people-mover system planned for the future.

Seven primary construction phases were developed to allow passengers to move through the building during construction with minimal disruption and confusion. Construction of the expansion will take place around a series of temporary walkways that lead from a temporary dropoff to the existing building, Smith explains. As the new structure is completed, areas of the older building will be renovated. The architects worked out the phasing scheme with the construction manager, a job normally done by the contractor alone. But there was no other way to quantify the huge scope of temporary construction and facilities required. Also, much of the phasing had to be acceptable to users. One phase, for example, might envision two baggage carousels in use when three is the acceptable minimum, explains Igou. And defining any scope within a phase must take into account whether numerous services (existing, temporary, or new) would be available, such as HVAC, security, mechanical, or life-safety. Bidders may propose different phasing, says Igou, but he expects few proposals. "They have three months to bid the job; we've lived with it for years."

Although SOM is currently working on construction documents for the addition, construction is already under way on one of the faceted, fritted-glass entry vestibules at the southeast corner of the expansion because the pedestrian bridge will be completed before construction begins on Terminal E. It will stand as a lonely sentinel at the edge of the site, awaiting a whole new team to complete it. Smith shrugs that off: "The phasing is fundamental to making the whole project work." ■



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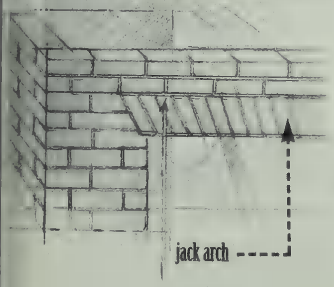

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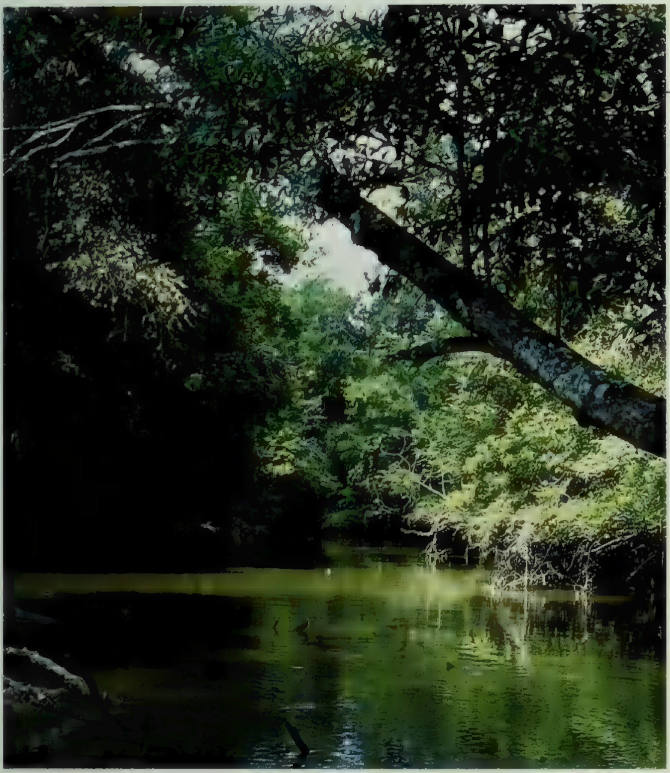
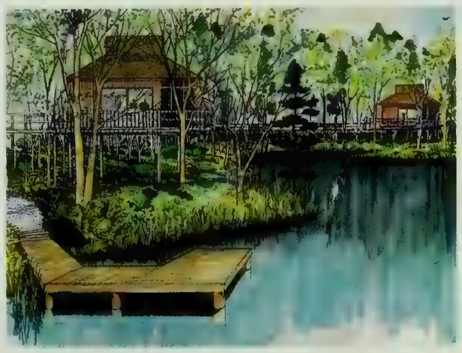
# Evaluating Hidden Site Conditions

## UNDERSTANDING THE SITE—BOTH ABOVE GROUND AND BELOW—KEEPS DESIGN WORK MOVING FORWARD AND FORESTALLS LEGAL PROBLEMS.



**by Wendy Talarico**

**During most of the year, the majority of land at Tickfaw State Park in Louisiana is under water (left). Instead of making the site a typical state park, the architect created an ecotourism center, where tourists and wetlands coexist (right).**



High summer and the dense forests at the future site of Tickfaw State Park are still and quiet. The soil below feels dry, though it's black as coffee grounds. Vines hang from tree branches in soft ringlets, while gray-green ferns nose the mossy perimeters of the broad trunks. Small, algae-flecked pools, almost obscured by fallen logs, reflect the bits of sun that filter through the thick canopy of leaves.

To the untrained eye, Tickfaw in the middle of summer seems no different than any other southern forest. But to those schooled in the nuances of vegetation and soil, Tickfaw is a wetland just waiting to recur. Once the seasons change and the burning sun passes its zenith, the water will take over again, making paths that are navigable in the summer into impassable quagmires, the calm pools into swamps.

Kurt Soderberg, AIA, a principal with Chenevert, Songy, Rodi & Soderberg, was given a mandate by Louisiana's Office of State Parks to build pavilions, parking, a swimming pool, and all the other "garden-variety" state park accoutrements at Tickfaw. But partway through the design stages Soderberg and landscape architect Patrick Moore discovered that of the 750 acres that make up the site, all but 60 are wetlands. "We realized we had to completely alter the plans, and still placate our client," he says. As if things weren't complicated enough, Soderberg and Moore discovered that the small parcel of buildable ground at the Tickfaw site is precisely where the evidence of Native American relics can be found. Disturbing that ground is likely to trigger an archaeological excavation.

It's not enough to know the topography of a site anymore; you must also know the vegetation and what is beneath it. Endangered species, archaeological finds, brownfields, wetlands—these are the kinds of surprises that can devastate a project or, at the very least, stop work for a few hours, weeks, or months. Architects may be forced to alter their plans, resite buildings, or scrap the project altogether. It's not unusual for site problems to engender legal battles and community ill-will.

To some degree, what is discovered depends on the building's location. In the Southwest, Native American relics are common; in the Northeast, brownfields are. But wetlands are by far the most common site condition architects encounter. Look at the Tickfaw land in an historical context and it seems obvious that Native Americans would have camped on the dry ground and hunted, fished, and foraged in the fecund marshes. Look at the soil and the plants and it's obvious that the area is flooded most of the year. But this sort of site sensitivity takes experience and training of a different kind than architectural schools provide. "We may be taught how to relate the building to the site contextually, but coping with difficult site conditions is not something we learn formally," says R. Christian Schmitt, AIA, a principal at Schmitt Sampson Architects.

Site surprises used to be the developer's bailiwick. But as federal, state, and local control over these issues tightens, and as the role of the designer changes, architects are increasingly pulled into the debate and, in

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**Continuing Education** *After reading this month's installment of the ARCHITECTURAL RECORD/AIA Continuing Education series, complete the questions (page 390) and check your answers (page 392). AIA members may fill out the self-report form (page 392) and send it in for two AIA Learning Units.*

**Learning Objectives** *After reading this article you will be able to:*

1. *Distinguish four types of hidden site conditions.*
2. *Describe steps to mitigate each of these four.*
3. *Appreciate the need for interdisciplinary teams to investigate hidden conditions.*

some cases, held responsible. For example, if an architect commissions a site analysis and finds nothing, he or she runs the risk of getting sued when toxic chemicals turn up later. There are also no clear standards for what constitutes a comprehensive site analysis or when it should be conducted. The federal government's requirements vary, depending on what's found on the site and what the government's jurisdiction is. Landscape architects, environmentalists, archaeologists, and other professionals who conduct analyses provide varying levels of thoroughness, according to how much is paid. And, as every architect knows, each dollar spent on the site is one less dollar devoted to the building.

Schmitt's firm designed a house at Brays Island, a residential development in South Carolina which requires that a highly detailed site analysis be approved by an architectural review board before drawings are submitted. It took Schmitt and a landscape architect close to four days to complete the analysis. The cost: about $5,000. But the results were worth it, he says. "You become so familiar with the site, with its history, its trees, the trails that the wildlife follow, the way the sun moves around it, and the soil, that you wind up with a design that couldn't work anywhere else," he says. Though the process is expensive, it yields a better building. Also, because the analysis is done early in the project, it greatly reduces the likelihood of a surprise later, when fixing it is costlier.

In the end, Soderberg and Moore converted Tickfaw into an ecotourism center, a place where tourists and wetlands coexist. Opening this summer, the redesigned park uses buildable land for interpretive centers, while the archaeological sites and wetlands are crisscrossed with trails and boardwalks. Instead of swimming pools, there are retention ponds to contain some of the water that floods the area.

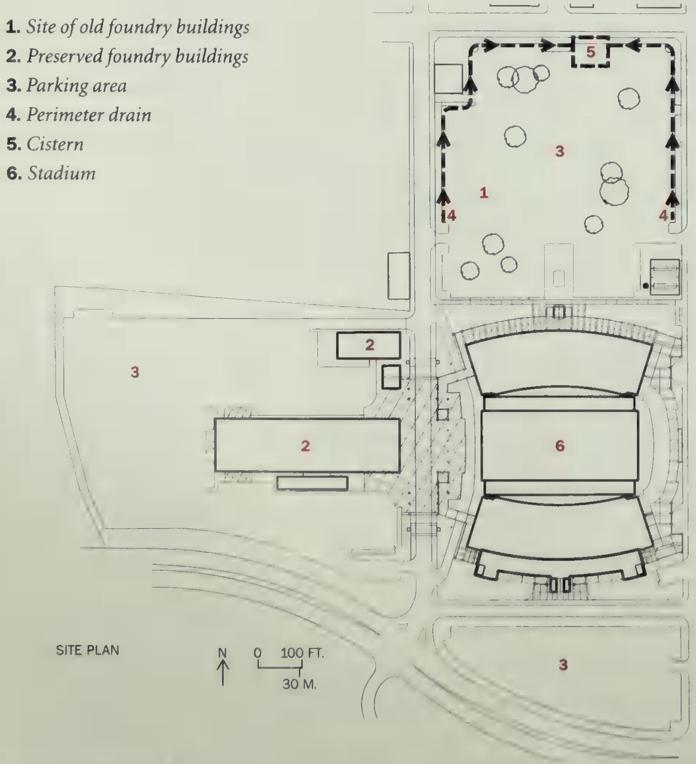
Knowing the ground conditions at Tickfaw in advance would have saved time for Soderberg. The contract was awarded in 1992, but because of the wetlands issue, construction on the $5 million project didn't begin until 1997. Consulting fees for environmental and archaeological work and permits ran about $90,000. But this example proves that, though architects may be afraid of finding site problems, they are also adept at solving them. "We took something that was a real obstacle and turned it into something innovative," Soderberg says.

**Brownfields**

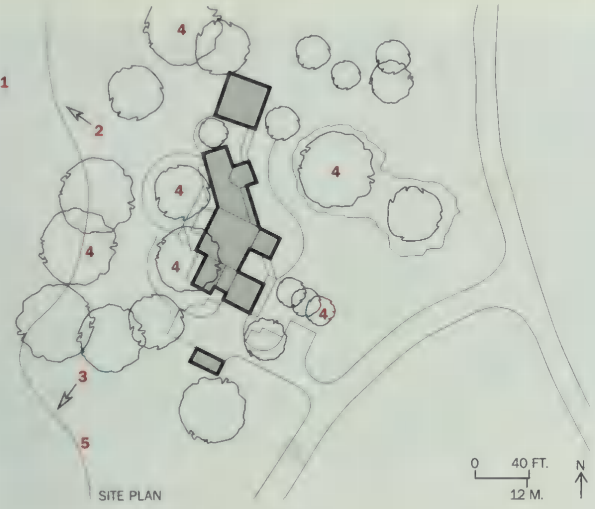
For almost two years, Bill Wilkerson, AIA, of Derthick, Henley & Wilkerson Architects, grappled with state and local officials to come up with a way to make a chemically polluted site in the industrial south side of Chattanooga, Tennessee, viable for a new stadium. Wilkerson is no expert in brownfield development. When it came to sorting out the tangle of government regulations, the architect admits that he "didn't have a clue." But the stadium project was a crash course for Wilkerson in how to deal with brownfields, a significant problem now that pristine sites in urban areas are rare and expensive. According to federal surveys, there are about 600,000 brownfield sites in the United States. Says Michael Pawlukiewicz, director of environmental research for the Urban Land Institute, "Just about every city site is a brownfield." Cleaning one up costs, in very general figures, at least $100,000 per acre, though there are federal programs that provide money to offset these costs.

**ARCHITECTS ARE ADEPT AT TURNING SITE OBSTACLES INTO ADVANTAGES.**

In 1993 Wilkerson's firm was commissioned to design the football and soccer stadium on the site of an old foundry. The firm first encountered a hundred 55-gallon drums sitting on one edge of the property and oozing unidentified liquids. In addition, the 33-acre parcel was frosted with a four-foot-deep layer of sand contaminated with heavy metals and petrochemicals, through which surface water was percolating. State regulators required capping the site with a nonporous material, such



**Chattanooga's new football and soccer stadium (above) rests on the contaminated site of an old foundry. To mitigate the pollution, the architects capped the site with impervious clay that was unearthed while dishing the stadium into the ground. Perimeter drains and cisterns capture water for the trees planted in the clay (left).**



**1.** *Marshes*
**2.** *Winter sunset*
**3.** *Summer sunset*
**4.** *Significant trees*
**5.** *Wetlands boundary*

**The detailed site analysis for this house (above) in Brays Island, a community in South Carolina, included mapping significant oak, pine, and hickory trees, prevailing winds, views, the location of the sunrise and sunset, and wetlands (left).**

as asphalt, to prevent the surface water from straining out contaminants and introducing them to the ground water.

"Initially this was a $29 million project," Wilkerson says. "Conducting a cleanup would have cost, based on the original estimate, at least $2 million. So we were in a position of finding a way to keep enough money for our project and still make the site usable. It was as if we were pouring our client's resources into the ground."

The first breakthrough came when the architects discovered, after testing every barrel, that the contents were mostly water. The other liquids were not dangerous and were easily disposed of. Next problem: the contaminated sand. Beneath that four-foot strata was a layer of impervious clay. Wilkerson and his team discovered that by dishing into the ground for part of the stadium they could scale back the mass of the complex and use the clay removed from the 16-foot-deep bowl to seal the site elsewhere. That would avoid the unappealing "asphalt sea" that state regulators had in mind, and the clay could support plantings and trees.

The stadium was completed last year and, thanks to creative problem solving, only $150,000 was spent on testing and abatement. But Wilkerson learned that working on this type of site requires close collaboration among engineers, bankers, environmental consultants, landscape architects, contractors, and lawyers; the problems encountered invariably cross interdisciplinary lines. He also worked with an environmental lawyer who served as his advocate in deciphering regulations and dealing with the state. Finally, while there are plenty of consultants willing to perform seemingly endless studies of contaminated sites, "you have to know when to end the studies and spend money on remediating the site instead," he says.

Investigation of a site's history and disclosure of contamination is a standard real estate practice that normally takes place before a parcel is sold. But that doesn't guarantee there won't be surprises. Robert Colangelo, the founder of *Brownfield News Magazine* and manager of a brownfield development company, says the first thing architects should ask for when they get involved in a commercial or industrial site is an ASTM phase-one site assessment. This document includes a site history and a sampling of the soil and groundwater, as well as analysis of any site structures. The cost to perform an assessment ranges from $6,000 to $200,000, depending on the size of the parcel and the type of contaminants. If contamination is uncovered mid-project, work should be stopped and the proper regulatory authorities contacted. Workers should stay away from the site until the problem is solved to avoid personal injury.

### Digging up bones

Every Native American tribe is loath to disturb burial sites. The Tunica Biloxi tribe of central Louisiana is no exception. When construction on the reservation is planned, they send Bill Day, the tribe's director of cultural and historical preservation, to look for archaeological materials. Evidence of what's underground can usually be found by looking carefully on the surface. Flakes of rock may indicate arrowheads, bits of pigment may indicate pottery, and, in the palm-flat land in this part of Louisiana, swells in the ground may indicate a burial mound.

**NEVER UNDERESTIMATE A COMMUNITY'S INVOLVEMENT WITH A GIVEN SITE.**

Day was researching the site of the Tunica Biloxi Economic Development Corporation, a 6,000-square-foot office building designed by Yeager, Watson and Associates. Prodding a small mound of soil, he uncovered bones that appeared to be human. He examined them and found a flattened musket ball lodged in what he believed to be the chest cavity. Further research led Day to conclude this was the body of a well-known tribal chief shot in the mid-1800s.

As a result of the find, the architects had to move the parking lot to allow tribal representatives to heap a four-foot-high mound over the site. The architects were not happy about the change in plans, though it came about early enough to keep costs minimal. "We're just not convinced that it was necessary," says Perry Watson, AIA. "We're not even sure those bones were human." On the reservation, architects must follow the tribe's tenets. To the elders, Bill Day's word was enough to convince them to move the parking lot. But to architects used to a more formalized methodology, the Tunica Biloxi's system is casual and mystifying.

The building is now complete, but the case underscores one of the rules of dealing with site problems: Never underestimate the community's involvement with a site, especially one with human remains.

When burials are found, the coroner, an archaeologist, or the local university's anthropology department (of which archaeology is a part) should be contacted.

**Other archaeological finds**

Nothing can hold up site work longer and introduce more extra costs than an archaeological excavation. Rules governing finds vary according to the locality, the size of the site, and who is involved in the project. If the property is private, finds can be bulldozed, except where there's legislation that says otherwise. If there are ties to the federal government, even if the project is only partially funded by a federal agency, the site falls under the National Historic Preservation Act, administered by the Department of the Interior. The property must then undergo a phase-one archaeological analysis, during which test pits are dug. If anything of value is found, the act requires a more extensive phase-two dig. A phase-three dig is a full-blown excavation. Since the act was passed 20 years ago, the number of archaeologists employed by public agencies has leaped exponentially.

When Coke Florance, FAIA, at KCF/SHG first walked the Washington, D.C., block where the $200 million MCI Arena would be built, it was nothing more than a city parking lot. KCF/SHG, working with Ellerbe Becket, and Devrouax & Purnell, charged ahead with the project, never suspecting there was anything beneath that asphalt. The project was so politically complex, no one even thought about the site analysis. "It was lost in the shuffle," Florance says.

Just before excavation, the site was tested. Historical records showed nothing of significance, but plenty of interesting things turned up once the digging began. The project quickly moved to phase-three status. A 70-member crew worked seven days a week, 12 hours a day, for three months. Meanwhile, the construction crews waited. Ultimately, the project came in two months late, though there were other problems during construction. The cost of the site work was $600,000. However, the finds, now on display at the arena, were of historical value. Says Florance, "In the end, the finds became an asset."

## WHAT TO DO WHEN A SITE PROBLEM IS FOUND

In all cases, notify the property owner and stop work until it is determined what must be done to comply with the law.

### ENDANGERED SPECIES

Before work begins, check with the United States Fish and Wildlife Service to see if there are endangered species in the region. On private land, contact a local environmental consultant or a nonprofit conservation group, such as the Sierra Club.

### ARCHAEOLOGICAL FIND

Before work begins, search historic literature to see if anything of significance was on the site. On lands with federal involvement, a phase-one study is required. For help, contact the United States Department of the Interior, the state archaeologist, the National Trust for Historic Preservation, or, in case of human remains, the coroner.

### TOXIC WASTE

Before work begins, make sure an ASTM phase-one study was conducted. On private lands, check local maps and records to see if the site was ever industrial. For help, contact the United States Environmental Protection Agency, an environmental attorney, or an environmental engineer.

### WETLANDS

If wetlands are suspected, have an environmental consultant, the regional department of environmental conservation, or the Army Corps of Engineers do a wetlands delineation. Findings are submitted to the Corps of Engineers. To develop in wetlands, a 404 permit is needed and compensatory wetlands must be created.

**Artifacts lurked below the MCI Arena (above), including items that once belonged to Frederick Douglass and Belle Lockwood.**

**Saving endangered species**

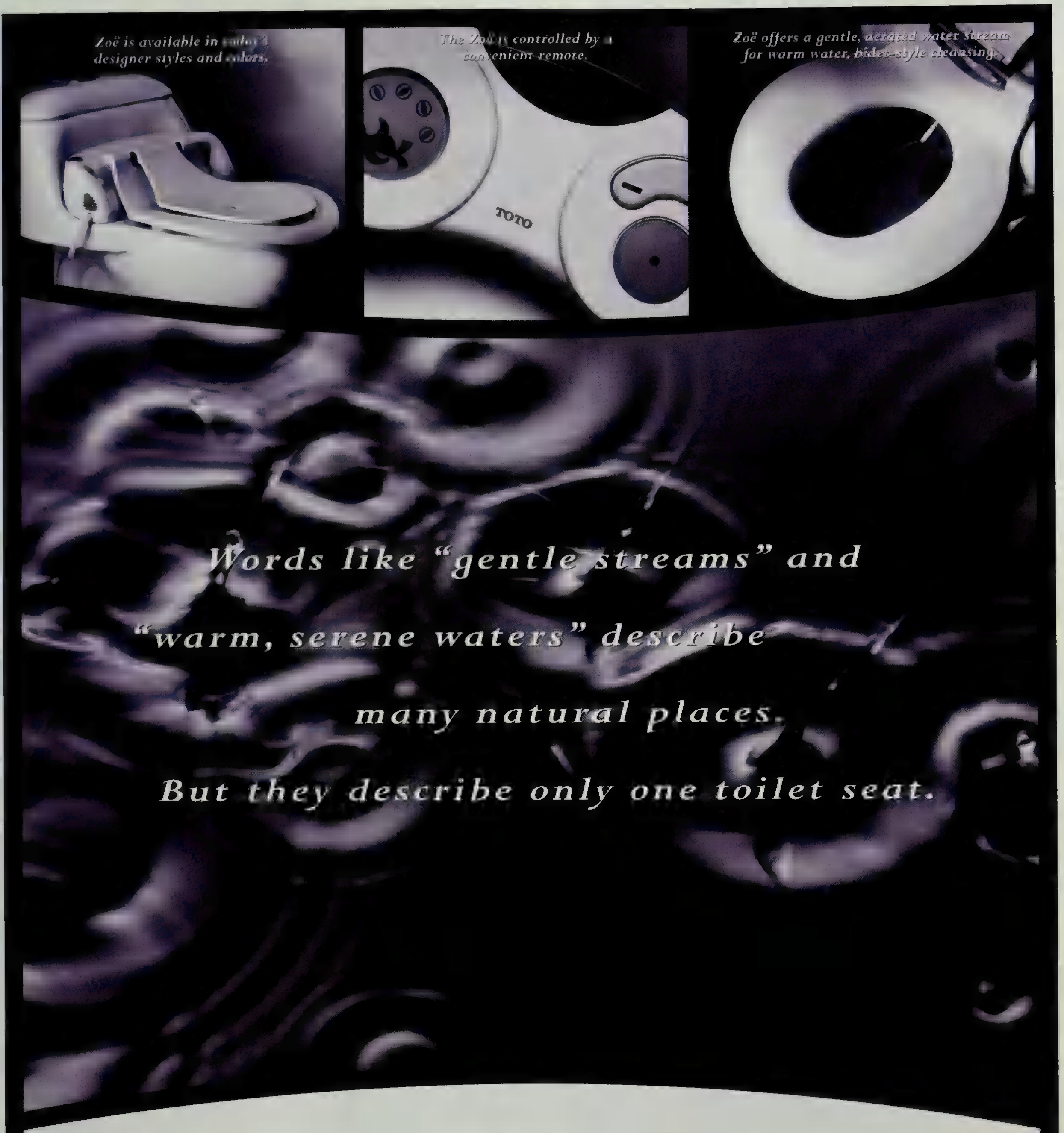
At Disney's Celebration, near Orlando, Florida, plans for a housing tract were altered when nesting eagles were found on the land. After negotiating with the Fish and Wildlife Service, the Florida Game and Freshwater Fish Department, and conservation groups, the Celebration Company, the site developer, had to give the eagles a 2,250-foot radius around the nest. This cost the company 12 acres of developable land.

Jim Yawn, the environmental project manager, says there were plans to set aside much of the land in that radius as part of a greenbelt flanking the development. But because of the eagles, the plan was changed to include the residential area. Yawn's bitterness over the decision is clear. "Studies have proven that the eagle population is booming in Florida. These birds are nesting in suburban backyards and even urban areas."

Part of the problem with laws governing site work, especially endangered species legislation, is that they seem subjective. "Laws change. The species on the endangered list change. There are differences in the ways the various species are handled and these recommendations change. What the developer next door did is different than what you do," says John Fay, a biologist for the United States Fish and Wildlife Service.

The highest concentration of endangered species is in the southern United States, especially where pressure from development is strong. Fay advises checking with local agencies to find out what species are on the list in the vicinity of the site. In sensitive areas, a study will have to be done before a building permit is issued. An environmental consultant should review the site, even if the land is private.

Decisions about what to do once something is found on a site—whether it's an endangered species, toxic waste, wetlands, or an archaeological site—aren't normally as one-sided as in Celebration's case. Unless what's found is highly significant, officials are willing to compromise. Says landscape architect Patrick Moore: "The days of beating your head against the wall with agencies are over. Now you can go to them and say, 'We have a problem. Help us solve it.'" ■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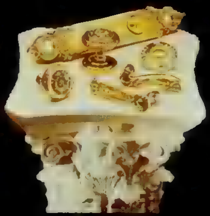

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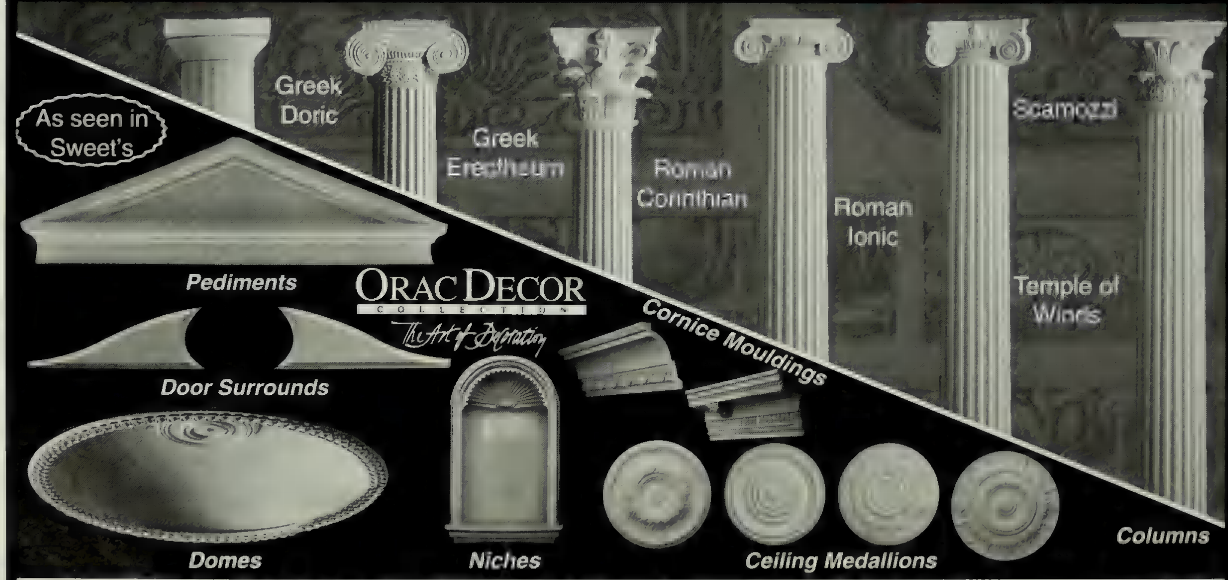

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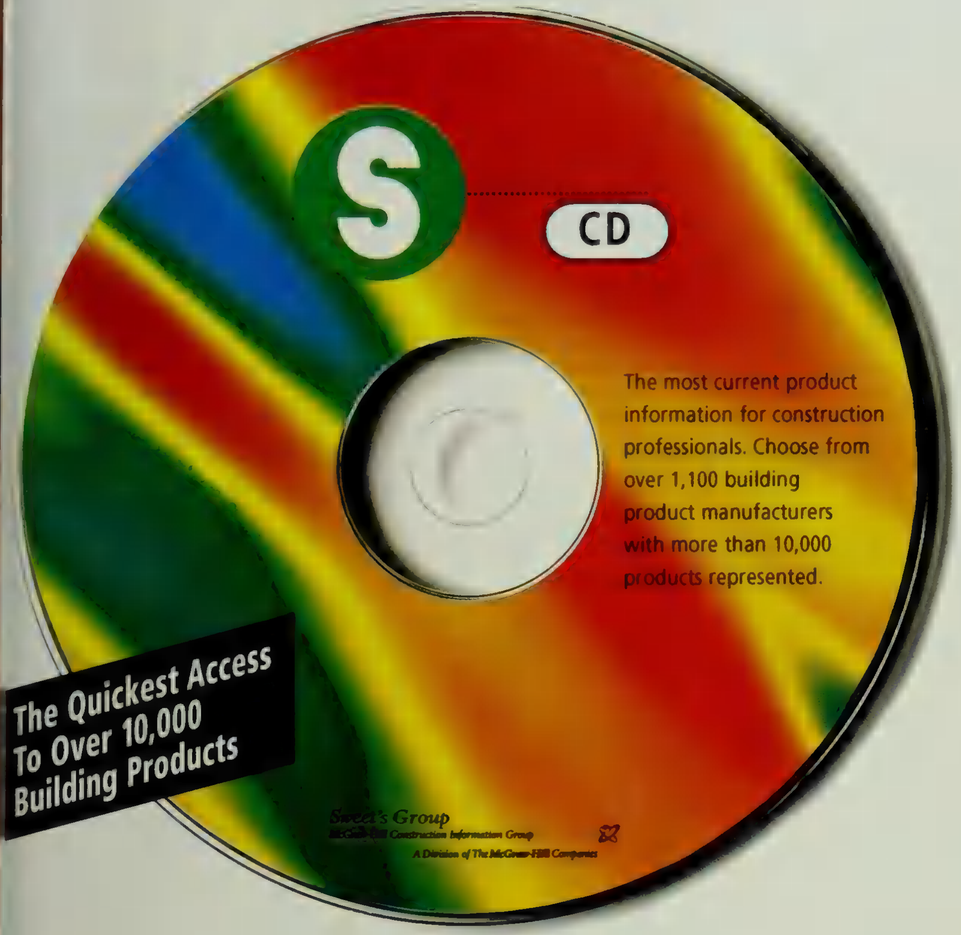
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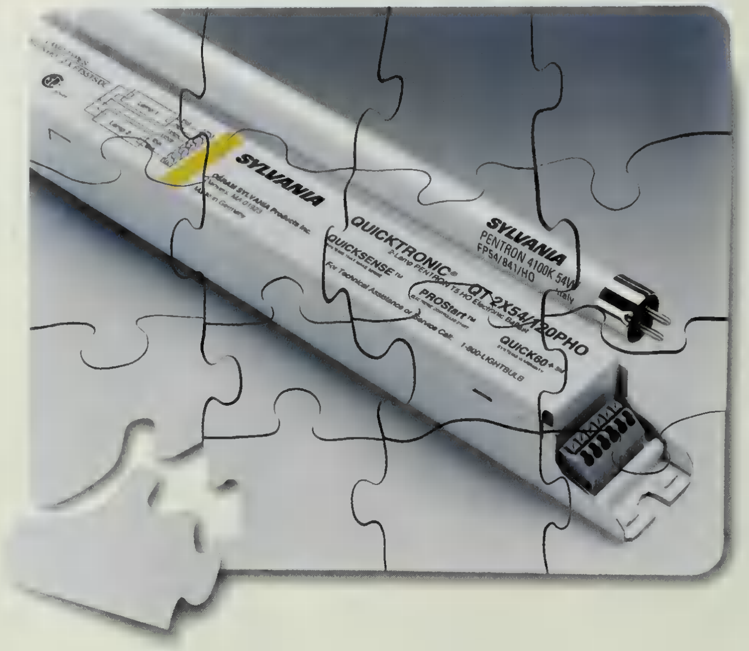

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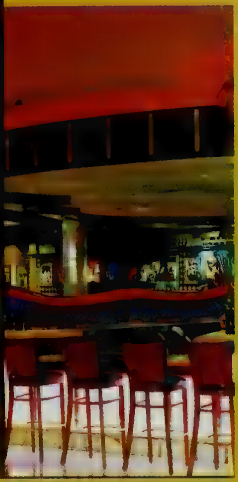

# LIGHTING...

*Two of the projects featured in this month's lighting section are places people go to be entertained. The lighting of the New National Theatre of Japan, in Tokyo (above left), was designed by Paul Marantz and Charles Stone of Fisher Marantz Renfro Stone. It complements Japanese architect Takahiko Yanagisawa's modern design by illuminating its rich materials and establishing a sense of orientation and procession. It does so quietly, and I would say, masterfully. People go to the theater to hear an opera or see a play—to escape to other worlds. Yet the building that houses these other worlds stands apart from them, unto itself, and so does its lighting. It is the sort of project where the architecture and the lighting are so interrelated that one cannot exist without the other.*

*The Motown Café at the New York New York Hotel and Casino, in Las Vegas, stands in striking contrast, although people go there for theater as well. They want to visit a fantasy version of a Detroit nightclub where the Temptations once sang. The lighting, by architect Jay Haverson and lighting designer Joe Kaplan, is bold and vibrant; it inspires nostalgia for experiences people probably never even had. Lighting is so integral to this project that Haverson has said, "There are so many special effects in this place, you could take the walls down and it would still stand up."*

*Because the ultimate effects are so dramatically different at the National Theatre and the Motown Café, the approach to lighting in the two projects would seem to be very different too. But this isn't true. Both projects use wall washing to define or deepen the appearance of surfaces and objects. Both use downlighting for tasks like reading programs or menus and dining. Focal glow is created where needed in each scheme.*

*The lighting designers of each venue also used dimming to the same effect—to spark anticipation. When light levels go down in the theater, audience members know the curtain is about to rise. At the café, when light levels go down, people know that dinner's over and it's time for the party to begin. If you switched the locales of the buildings or the nationalities of the people inside, the patrons would still grasp the meaning of the lighting change.*

*Lighting makes a significant contribution to the success of both buildings. Whatever the goals of each architect were, the lighting designers' ability to understand those issues and to communicate them with light helped to create a successful space. And turning those goals into positive experiences for a building's users is what makes the difference between a truly awful place and a truly great one.* Charles D. Linn, AIA

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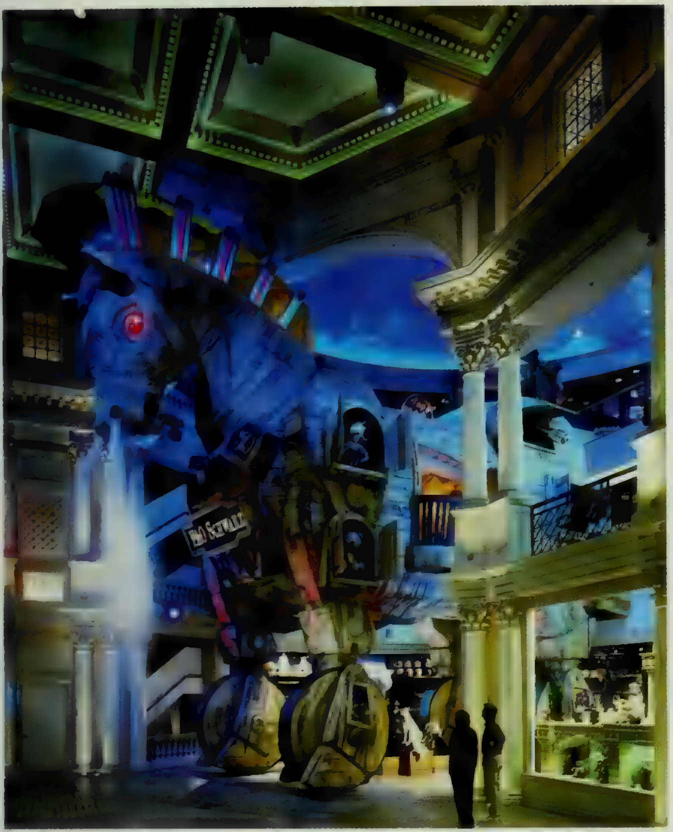
# CREATIVE USES



## FAO SCHWARZ VEGAS NODS TO CLASSICS WITH A REALLY WILD TROJAN HORSE

In Las Vegas, FAO Schwarz's signature rocking horse has been reborn as a flashing, smoking, animated spectacle fit for this city of pure theater. The 48-foot-tall Trojan horse continues the classical theme of the shopping mall at Caesar's Palace where FAO Schwarz is located. It straddles the entrance of the three-story toy emporium and draws large crowds with a 15-minute animated performance. It nods its head while incandescent eyes pulsate, a strobe light flashes inside its mane, and smoke billows out of its nostrils.

A host of characters—such as Truffles the Teddy Bear, a chorus line of Barbies, a serenading cow, a swinging monkey, and a robotic arm that periodically dusts the horse—appear and disappear from behind trap doors on the animal's surface.

Lighting for the performance, and for the 56,000-square-foot store, was designed by the New York City–based firm Johnson Schwinghammer Lighting Consultants. Lighting designer and project manager Bill Schwinghammer used computer-controlled lights for the show, which starts every 30 minutes. Theatrical fixtures mounted on the high vaulted ceiling and on either side of the store entrance light the horse itself. The motor-driven lights can tilt and rotate a full 360 degrees and are programmed to change colors in synchronization with the music and action. *Nayana Currimbhoy*

## VERSATILITY IS TODAY'S LESSON FOR BUSINESS SCHOOL CLASSROOMS

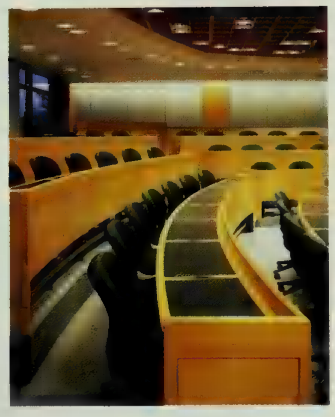
At Harvard Business School's McCollum Center, mid-career executives take classes in seminar rooms equipped with state-of-the-art video, audio, and data-processing equipment. Desks allow students to hook up their laptops to a network. And rooms are equipped for video conferencing as well as for videotaping classes.

With all the different kinds of tasks taking place in the rooms, the lighting plan had to be sophisticated enough to accommodate many disparate lighting requirements. The goal of the lighting designers, says architect Peter Kuttner, of Cambridge Seven Architects, was to make the fixtures invisible.

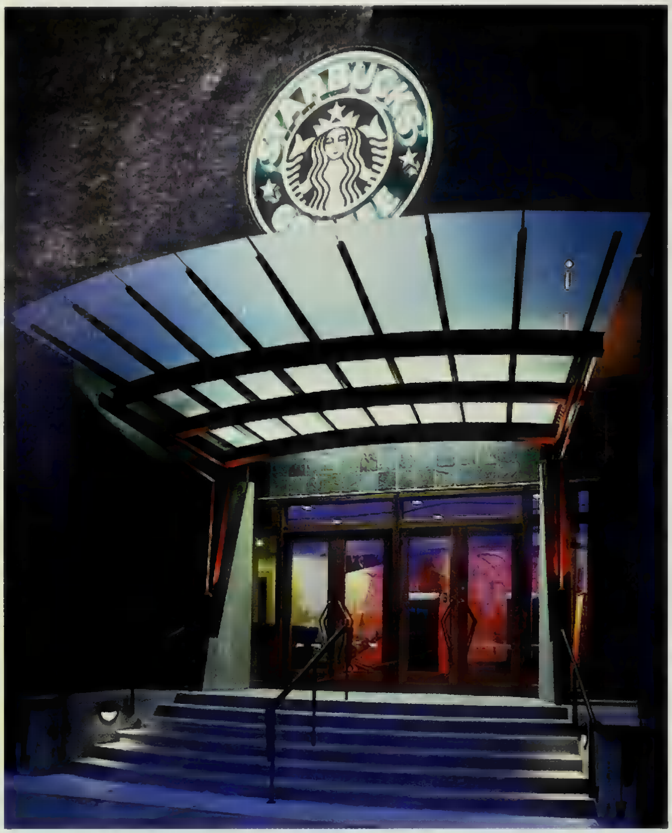
The lighting designers, Berg/Howland Associates, used recessed compact fluorescent wall washers and linear fluorescent lighting hidden in coves for perimeter lighting and to provide background illumination for videotaping.

Lighting for the desktops comes from recessed downlights placed to follow the seating pattern. These are fitted with 100W halogen PAR lamps to ensure good color rendering for videotaping and let light be dimmed during screenings and video conferences. Parabolic reflectors minimize reflections in screens and provide even illumination for desktop tasks.

Flexibility and control were two other important considerations for the classrooms. All the light sources are dimmable, and the control system accommodates a range of preferences, like manipulating the audiovisual equipment and the projection screen from a touch panel on the lectern or with one of three one-button controls located at the chalk rail. Adept users can create custom settings at the touch screen for a wider range of control options. *N.C.*

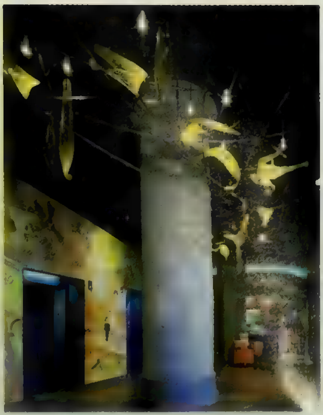


**A classroom used for multimedia presentations must easily accommodate different kinds of tasks.**



## LIGHT SCULPTURE STIRS VISIONS OF FALLING LEAVES AND COFFEE PLANTS

The headquarters of the giant coffee chain Starbucks is located in a landmark building in downtown Seattle. A canopy of wood and diffusing glass over the entrance to the building is lit from above by a strip-fluorescent sign light, and low-voltage halogen uplights placed on the canopy supports provide supplementary lighting. Compact fluorescent steplights flank the stairs.



When remodeling the building's public areas, the architectural firm of Adams/Mohler was confronted with large column-filled volumes of space that received no daylight. "We decided to emphasize the immensity of the volume by carefully composing the objects within the space," says principal Rick Mohler.

A large column in the center of the space was turned into both a source of light and a work of art. Designed by local artisan Brent Markee, the sculpture, an abstract tree, is composed of blown-glass leaves, copper-tubing branches, and 75W spotlights suspended on pivoting arms. "The luminaires cast a pattern of light and shadow on the concrete floor, suggesting the dappled sunshine of coffee plantations," says Mohler. *N.C.*

## NEW NASDAQ MARKETSITE DESIGN INSPIRED BY COMPUTER CHIP

Nasdaq's MarketSite headquarters in New York City is designed to show technology at work. A competitor of the New York Stock Exchange, Nasdaq is a securities market known for technology stocks such as Microsoft and Intel. Nasdaq's management wanted a physical environment that would help communicate the image of a company that has billed itself as "the stock market for the next 100 years."

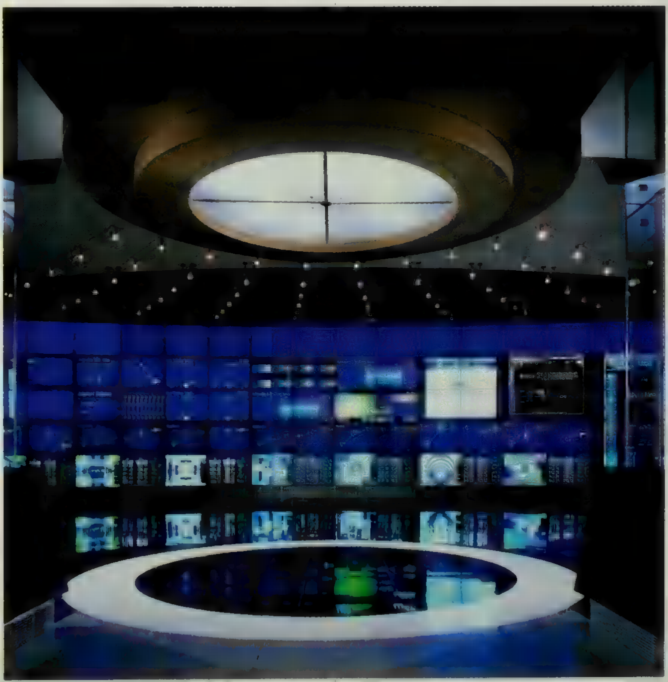
"The client wanted a space that would look as different as possible from the paper-strewn New York Stock Exchange—one that resembles the inside of a computer," says Harout Dedeyan, of C & J Partners, the Pasadena, California, design and marketing firm that won the job in a competition.

"We wanted to give visitors the experience of seeing information traveling through a network," adds lighting designer Robert White, who was with Illuminating Concepts when he designed his part of the project.

As visitors are ushered from the understated elevator lobby into the MarketSite facility, they are treated to a carefully choreographed light show, controlled from the receptionist's desk, which leads them through the space. MR16 halogen lights are strung on cables like microchips on a circuit board and fan outward from a central light source.

These lights are programmed to dim in a wave that draws attention first to a neon-lit, shimmering artwork of silk and metal fabric and then leads the eye through the space, which terminates at a curved 55-by-11-foot video wall comprising 100 video monitors. Continuously updated news, stock prices, and performance information are displayed at this state-of-the-art digital information system.

Circuitry for the space is covered by a raised, accessible-tile floor custom-designed in Italy. You can take a virtual tour of Nasdaq's MarketSite headquarters by visiting the firm's Web site at nasdaq.com. *N.C.*



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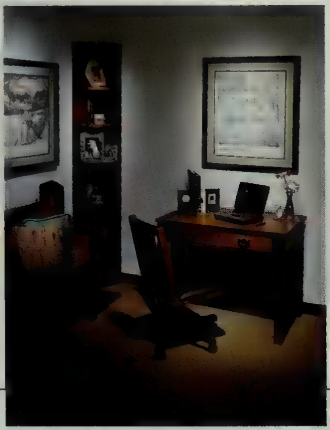

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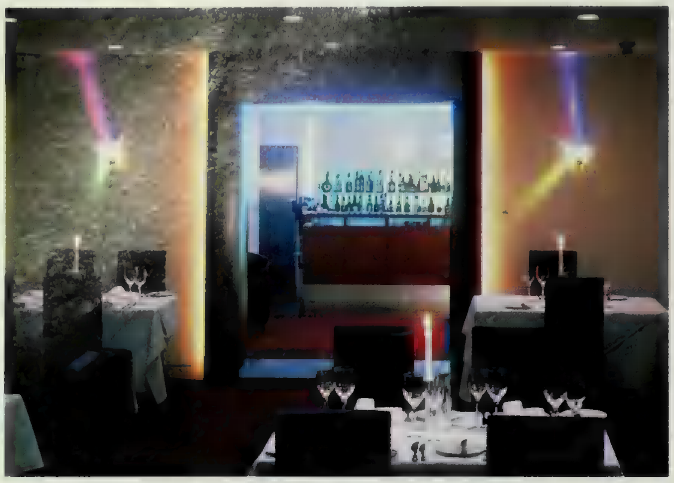


## SOMEWHERE OVER THE RAINBOW IS UNDERGROUND IN EDINBURGH

The client wanted to have the best restaurant in Scotland, and he wanted lighting to play a crucial role in the design. He approached Edinburgh-based lighting designer Jonathan Speirs to come up with a design concept for his basement venue, Restaurant 36, even before he hired an architect.

A whimsical fixture designed and studio-manufactured by German designer Gregory Prade is central to the lighting of the restaurant. Called 77 Moons, the wall-mounted luminaire casts light in colorful patterns. It consists of a pair of drilled glass marbles anchoring a short aluminum rod that holds a butterfly-shaped luminaire. The butterfly's wings are two adjustable dichroic filters with a low-voltage halogen capsule at the center. When the white light passes through the two semireflecting filters, it is broken up into all the colors of the rainbow; the colors change when the filters move. Speirs and Prade hung the fixtures as art on the otherwise bare walls, and patrons are encouraged to participate in the lighting design of the restaurant by adjusting the filters until the light suits their fancy.

A transitional space created by the change in levels between the bar and the dining room has been treated as an entryway. Fluorescent lamps sleeved in blue theater gel are set in a glass panel behind the riser of the step to light the way to the dining room.

Throughout the restaurant, colored fluorescent tubes are used to illuminate pockets set into walls, creating sharp silhouettes and shadows in a space with no natural light whatsoever. Spotlights on flowers and uplights placed in niches behind banquettes also help to add depth to the 50-seat restaurant.

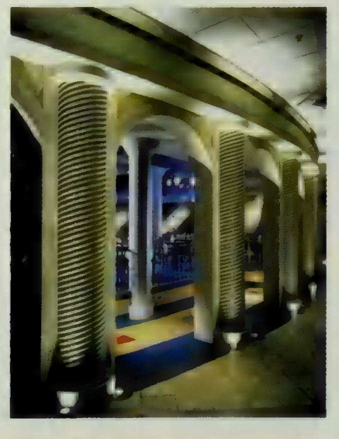
The exterior sign consists of the number 36 lying horizontally in a large bed of smooth pebbles and ringed in gas flames; the sign's bluish-yellow glow beckons visitors to descend the steps leading to Restaurant 36. *N.C.*

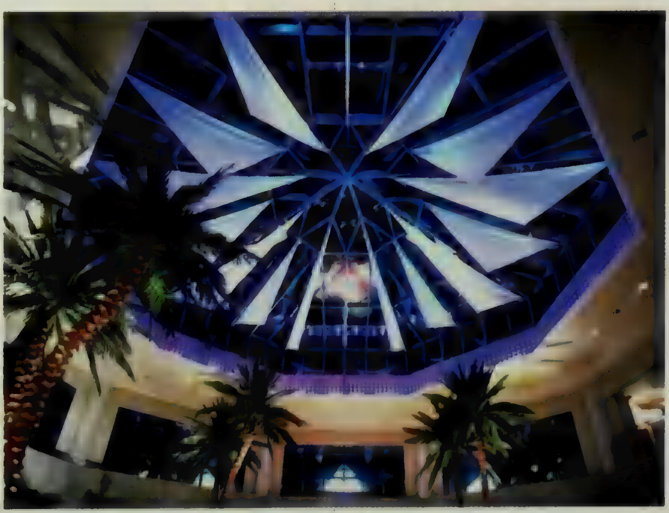
## TERMINAL BUILDING TRANSPORTS MISSOURIANS TO MEDITERRANEAN

The Argosy Terminal Building is the on-shore gateway to the Argosy Casino, which, in keeping with Missouri gaming laws, is located on a boat in the Missouri River. Set on a 40-acre site adjacent to the highway in Riverside, the terminal building is designed to set the mood for a fling at the casino. A sumptuous entryway of sails and fountains leads to the two-story building, which contains restaurants, bars, and private party rooms. "The procession through the building is intended to transport patrons from the everyday world into a surrealistic fantasy world," says project designer David Reid of the Kansas City–based architecture firm WRS.

Designed by Bruce Yarnell Associates, the lighting in the terminal building works with the architecture to evoke a southern Mediterranean feeling. The 80,000-square-foot building is designed with brick walls, mosaic floors, and palm trees, set around a large skylight. At night, a circular arrangement of white sails suspended from the skylight is illuminated by MR16 track fixtures set in a cove at the skylight's perimeter. Fitted with dichroic filters of blue and green, and wired to three circuits that cross-fade between blue, green, and white light, the lights bathe the sails in a variety of changing colors. An uplit arcade of columns sculpted in a spiral pattern surrounds the skylight.

From the atrium, guests walk through a gallery to board the riverboat casino. Conceived as a village street, the gallery is articulated with massive stucco walls that are randomly punctured with deep openings. Here, MR16 uplights in the openings are designed to continue the effect of strong light and shade. Another highlight of the space is a heavenly light show of sorts: computer-controlled fiber-optic strands simulate the dawn-to-dark cycle of the skies over Kansas City, complete with the constellations. *N.C.*





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## ANIMATED AND INTERACTIVE DESIGN LIGHTS UP FINANCIAL DISTRICT

Landscape architect Ken Smith and lighting designer Jim Conti were brought together this past winter by a local business alliance seeking a proposal for a holiday makeover of a small cement park in New York City's Financial District. The two were appalled by the ranks of '70s-era lollipop lights that interrupted the space. So they resolved to hide them.

In their scheme, translucent cones covered the light poles. A larger cone in the center lent a strong sense of order to the arrangement. Liberty Plaza would, for the winter at least, become a hybrid Japanese garden and French topiary, with the cones functioning as both lanterns and abstracted trees.

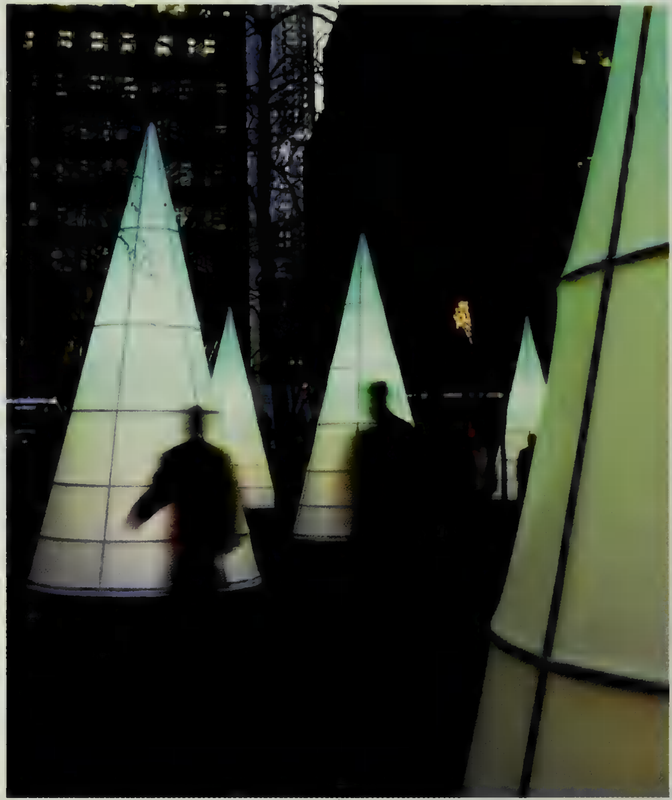
The proposal was accepted by the business alliance and the project was budgeted at $125,000, with many support services provided free of charge by the owner of the site.

Frames for the cones were made from one-inch-diameter galvanized steel piping, and the vinyl sheathing was the same material used for pizzeria awnings. The 16 small cones were 16 feet high and 8 feet in diameter at the base, roomy enough to enclose the existing 10-foot-high lollipop lights as well as the bunches of lights that would be installed below them. The single big cone was 24 feet high and 12 feet in diameter at the base.

Clear globes replaced the 250W phosphor-coated mercury vapor globes at the top of the poles to create a greenish-white color at the apex of each cone. The rest of the color was provided by a tripod of three four-foot 40W T12 D835 tubes, each facing in a different direction. The southeastern face of each cone was lit with a saturated yellow filter, the northeastern face with a pale lavender, and the western face with a deep amber, corresponding to different qualities of sunlight. An opaque disk wrapped around the pole seven feet above the ground prevented the light of the three fixtures from interfering too much with the light of the globe above.

Inside the big cone, which had no lollipop light, a tripod of eight-foot fixtures contained six four-foot lamps filtered with reddish-purple gels. PAR lamps suspended from the tripod bounced light from crumpled silver Mylar on the floor of the cone to its tip. The resulting aquatic light softened the hard white light of Christmas bulbs stuffed inside Mylar-backed tubes and strung up near the cone's surface.

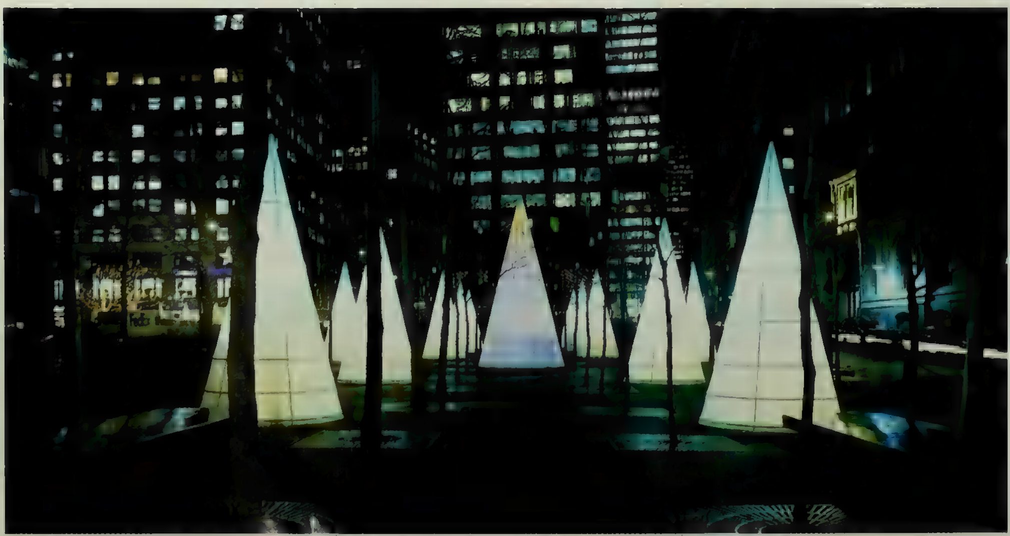
Since there were three colored faces for each cone except the center cone, the colors appeared to change as viewers walked through or past the park. "Animation isn't just flashing or dimming lights," says Conti. "It can come from perception too."



**This winter, translucent cones covered 1970s-era lollipop lights in New York City's Liberty Plaza.**

Smith and Conti added sound, hanging 200 wind chimes of varying size and pitch from the trees. Conti programmed 32 samples of "Oh Tannenbaum" using 32 bell sounds, set to play at varying intervals in the cones.

Some visitors to the park were disoriented by such a full engagement with light and sound. According to Conti, businesspeople rushing from Wall Street to the World Trade Center visibly slowed their pace once they hit the park, taking time to get a little lost. Kids who had been out all night clubbing took the trip downtown to relax in the park at dawn. For perhaps the first time in the 30 years since the demolition of Ernest Flagg's Singer Building, which once stood here, the site sparked wonder. *David Simon Morton*



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PHOTOGRAPHY © JOHN BACK

## PARIS INSPIRES SISTER CITY CHICAGO TO LIGHTEN UP A LOT

Chicagoans have never been big on lighting. In fact, when Wrigley Field was finally illuminated for night play in 1988, fans mourned the passing of the Cubs' day-game-only tradition.

But now, with a new lighting master plan in the works, Chicago's Loop, considered one of the most vigorous downtown areas in the United States, is poised to take on a new glow. A number of its landmarks and streets are already impressively lit, but efforts by Mayor Richard A. Daley would take this urban area to even higher levels of brightness.

The Chicago Downtown Lighting Master Plan has been overseen by Skidmore, Owings & Merrill and the lighting design firm Schuler & Shook. It is outlined in a four-part report commissioned jointly by the City of Chicago's Departments of Planning and Development, Transportation, and Streets and Sanitation.

"This plan was a combination of a number of different projects that were all going on at the same time," says Robert Shook of Schuler & Shook. "First, there was a push to standardize all the streetlighting schemes downtown. That effort was coming from the department in charge of maintaining the equipment." Different groups in each area of the Loop were asking for their own special decorative lighting fixtures, making it extremely difficult for the city to maintain a complete inventory of lamps, decorative globes, and other parts. "And," adds Shook, "the street lighting didn't have a unified appearance."

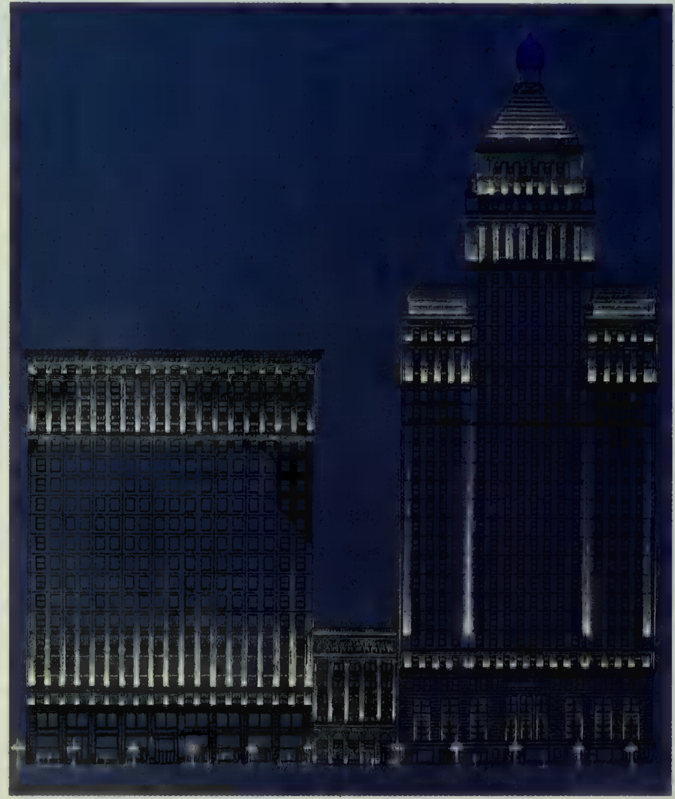
The report identifies four different types of street-lighting fixtures, which vary in height and style depending on their location. The tallest, fitted with two acorn-type globes, would be installed along Chicago's famed State Street. Michigan Avenue and Wacker Drive, which borders the Loop on the east, north, and west sides, would have shorter poles fitted with spherical globes. The plan also gives specifications for each proposed fixture, including style, type, finish, and cost.

It is easy to see the advantages of better street lighting, especially in terms of pedestrian safety and security. Understanding what can be gained by lighting the city's nightscape requires a little more imagination. The second part of the master plan was inspired by a visit Mayor Daley made to Paris, Chicago's sister city, two and a half years ago. He was smitten with the grandeur of the City of Light's illuminated buildings and charged some of his staff members with seeing how Chicago might light up its own skyline.

"Chicago's public buildings are the obvious targets. Many of them are wonderful historic buildings, and if the city wants to, it can light them. It's tougher to get the privately owned buildings lit," Shook points out. So the mayor asked the Department of Planning to create a presentation that he would make to civic organizations and building owners.

This eventually blossomed into a program called HighLight Chicago, which is operated by the city's Department of Cultural Affairs. Building owners who participate donate money to a not-for-profit corporation, which is used to finance design and construction services for their buildings. The idea is that the money they contribute to lighting buildings can be written off of federal and local income taxes. "The city wanted to give building owners an incentive to light the buildings without actually paying for them to be lighted," says Shook.

The organizers of HighLight Chicago put together a report that gives building owners a short course in the principles of lighting exteriors and outlines what kinds of buildings make good candidates for illumination. It also inventories which buildings have already been lit in the Loop, and others that might benefit from illumination. Case studies—with renderings and cost estimates of labor and materials for installation and operation—of notable buildings that have never been lit, such as the Straus, Karpen, and McCormick buildings (shown above), are included. A projection of annual costs and tax savings for a representative project is given too.



**Left to right: The Straus, Karpen, and McCormick buildings, on Michigan Avenue, are among the structures that Skidmore, Owings & Merrill and Schuler & Shook's lighting design master plan for Chicago has suggested should be illuminated. The rendering and an explanation of the lighting concepts were presented as part of the plan.**

RENDERING COURTESY OF THE D'ANGELO FAMILY

The last two sections of the lighting master plan are concerned with two features of the Loop that are landmarks of the Chicago streetscape: the elevated train stations downtown and the bridges at the edge of the Chicago River.

"The elevated stations are too big to ignore," says Shook. "So you may as well make something nice out of them." The key strategy proposed in the report was to use light to make it easier to identify stations at night, as well as to improve pedestrian safety.

The 16 bridges that span the Chicago River are important gateways into the Loop. The plan recommends that they be illuminated by sources mounted on or near bridge structures so that the light will emphasize key architectural details and the overall forms of the bridges.

Those interested in learning more about HighLight Chicago can contact the organization at 312/742-1175. *C.D.L.*

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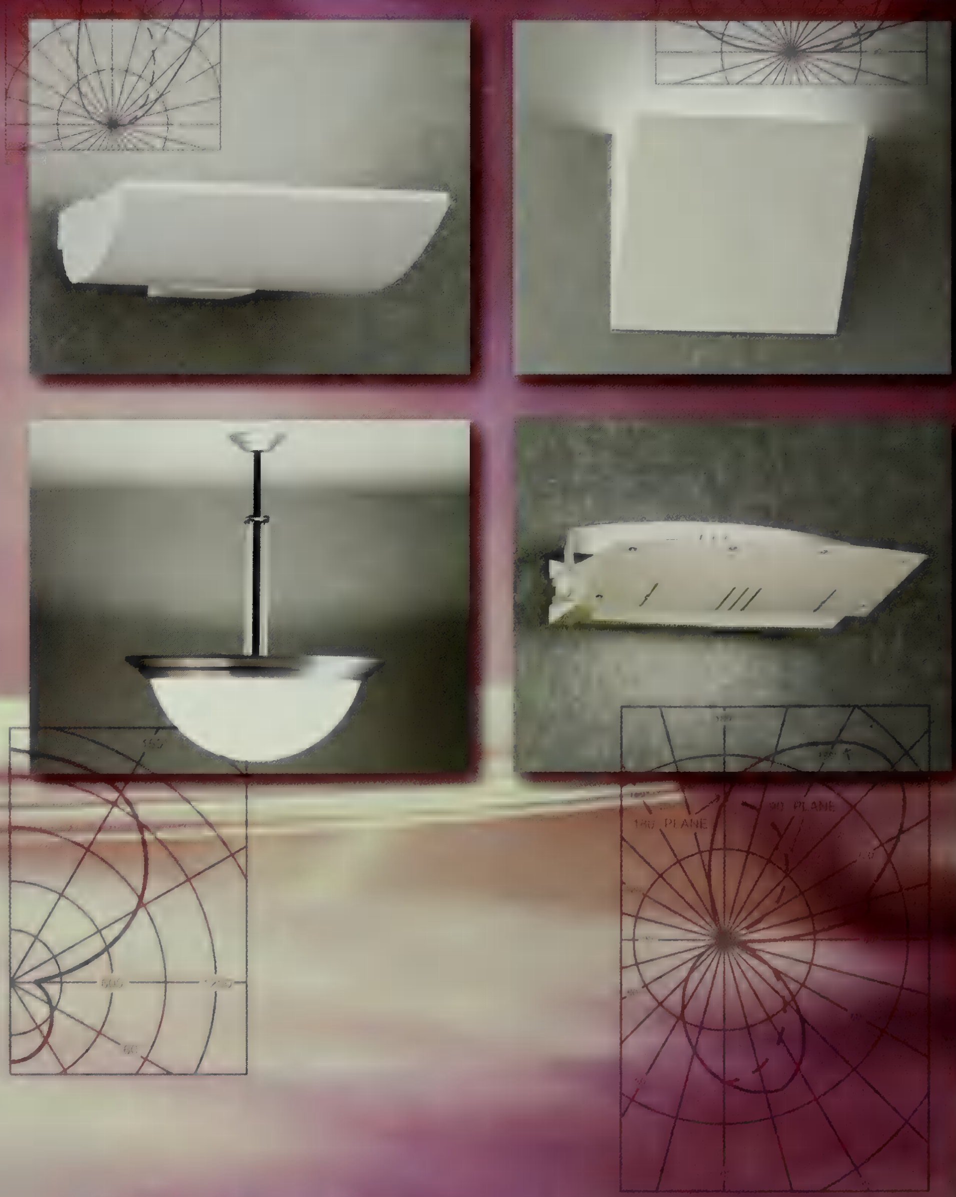

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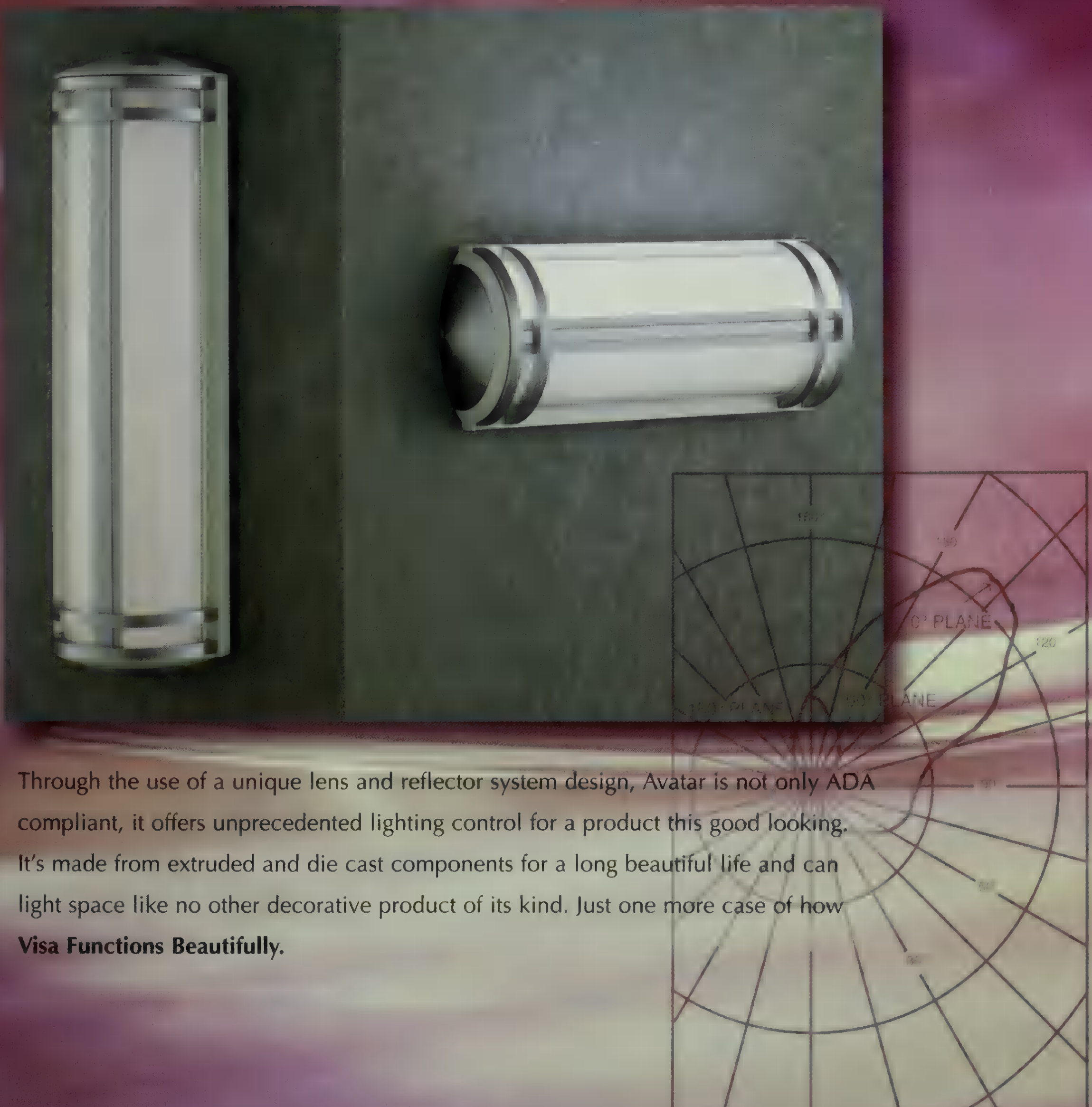

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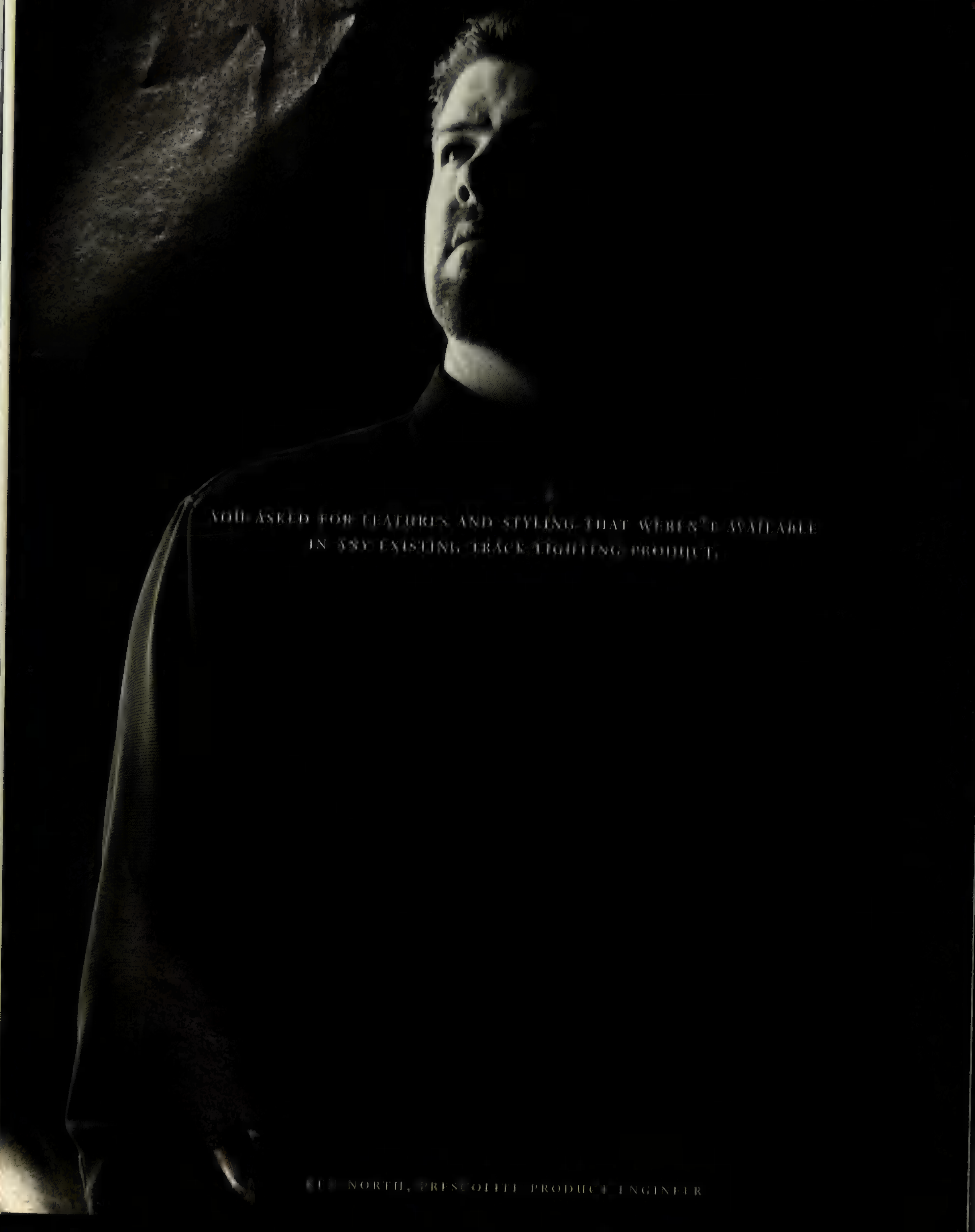
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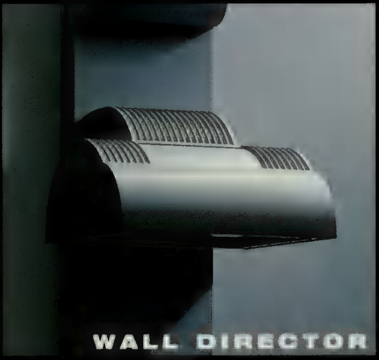

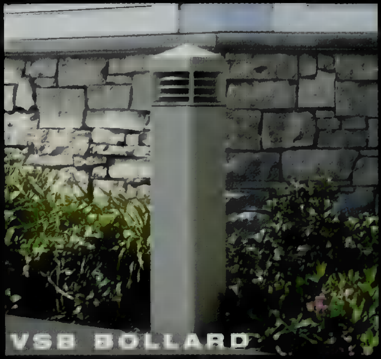

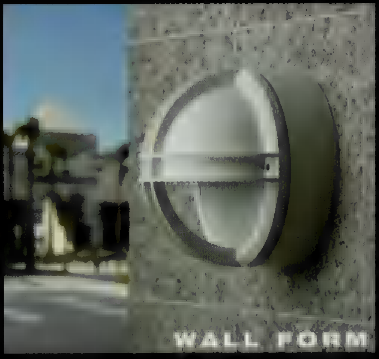

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# INTERVIEW: How Designers Applied Classical Lighting to a Modern Theater

by Charles Linn, AIA

When the competition for Japan's New National Theatre was held in 1986, multipurpose theaters, which could be adapted at will for opera, concerts, or drama, were the norm in Japan. The New National, designed by Takahiko Yanagisawa and completed in 1997, took Japanese theater design in a new direction: with three separate houses, it could play host to many different types of performance simultaneously.

Occupying an entire city block in the Shibuya section of Tokyo, the 741,000-square-foot New National has a forbidding presence—the massive, windowless concrete exterior walls suggest a bunker more than a center for the arts. But once you pass through the public space outside the lobby, the building's appearance changes sharply. An uplit wall of rough-hewn stone appears to float in a fragile black pool of water, reflecting the oak-paneled foyer of the opera house beyond it. These elements begin to express the shift in contrast between the coldness of the theater's exterior and the warmth of its interior.

Inside the facility, the opera house seats 1,810; an experimental theater, the Pit, holds 486 people; and the playhouse, which can be converted from a traditional proscenium theater to a thrust stage, has the capacity for 1,038. When the playhouse is in the latter configuration, opening the ceiling provides access to a second flytower.

For the New National, the architect based his design on the premise that the theater is a place where one can encounter firsthand the power of human creativity. He created a composition of spaces—beyond the stages themselves—that not only engage the visitors but put them on stage. A veteran designer of cultural facilities in Japan, Yanagisawa, principal of TAK Associated Architects, won the 1998 Architectural Institute of Japan Prize for the New National Theatre.

## Lighting the New National Theatre

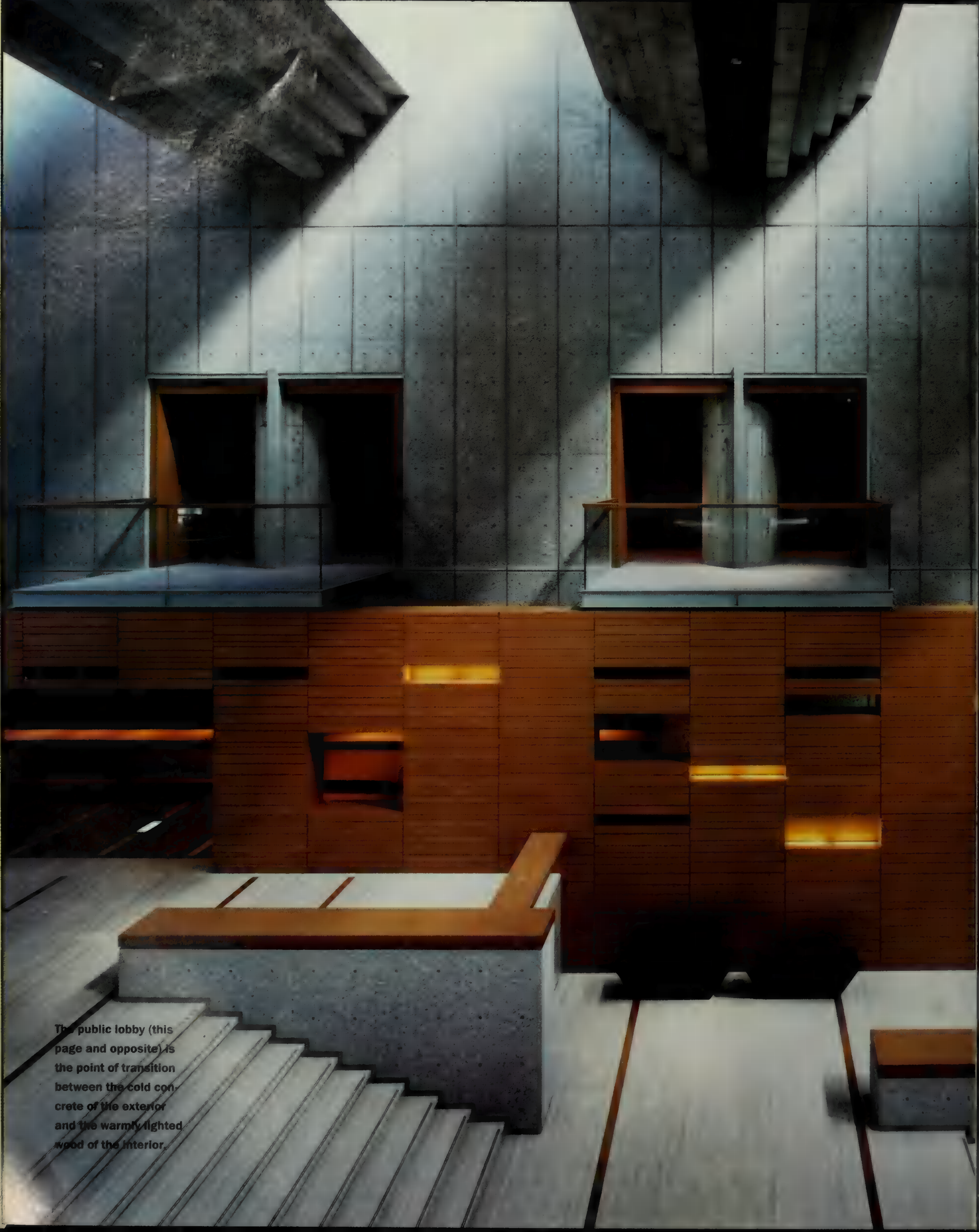
Lighting designers Paul Marantz and Charles Stone, principals of Fisher Marantz Renfro Stone of New York City, had collaborated with Yanagisawa on the recently completed New Tokyo Metropolitan Museum of Art. For the theater, their arrangement with Yanagisawa was atypical. In the United States, lighting designers work directly for the architect. In this case the lighting designers consulted for Yamagiwa Laboratories, the lighting manufacturer that furnished fixtures for the project. Yamagiwa normally offers design services as part of its package, much the way manufacturers offer design services in Europe. But even though Yanagisawa didn't employ Marantz and Stone's firm directly, the lighting designers worked intimately with him on the theater.

Long a presence on the international scene—the firm's résumé lists 55 projects beyond U.S. borders—Fisher Marantz Renfro Stone came up with a design for the New National that would be considered classical in any country: incandescent downlighting and wall washing define layers of space. The scheme emphasizes the architecture's complexity and shows off Yanagisawa's work as a series of geometric, cerebral compositions—an effect much easier to describe than to achieve.

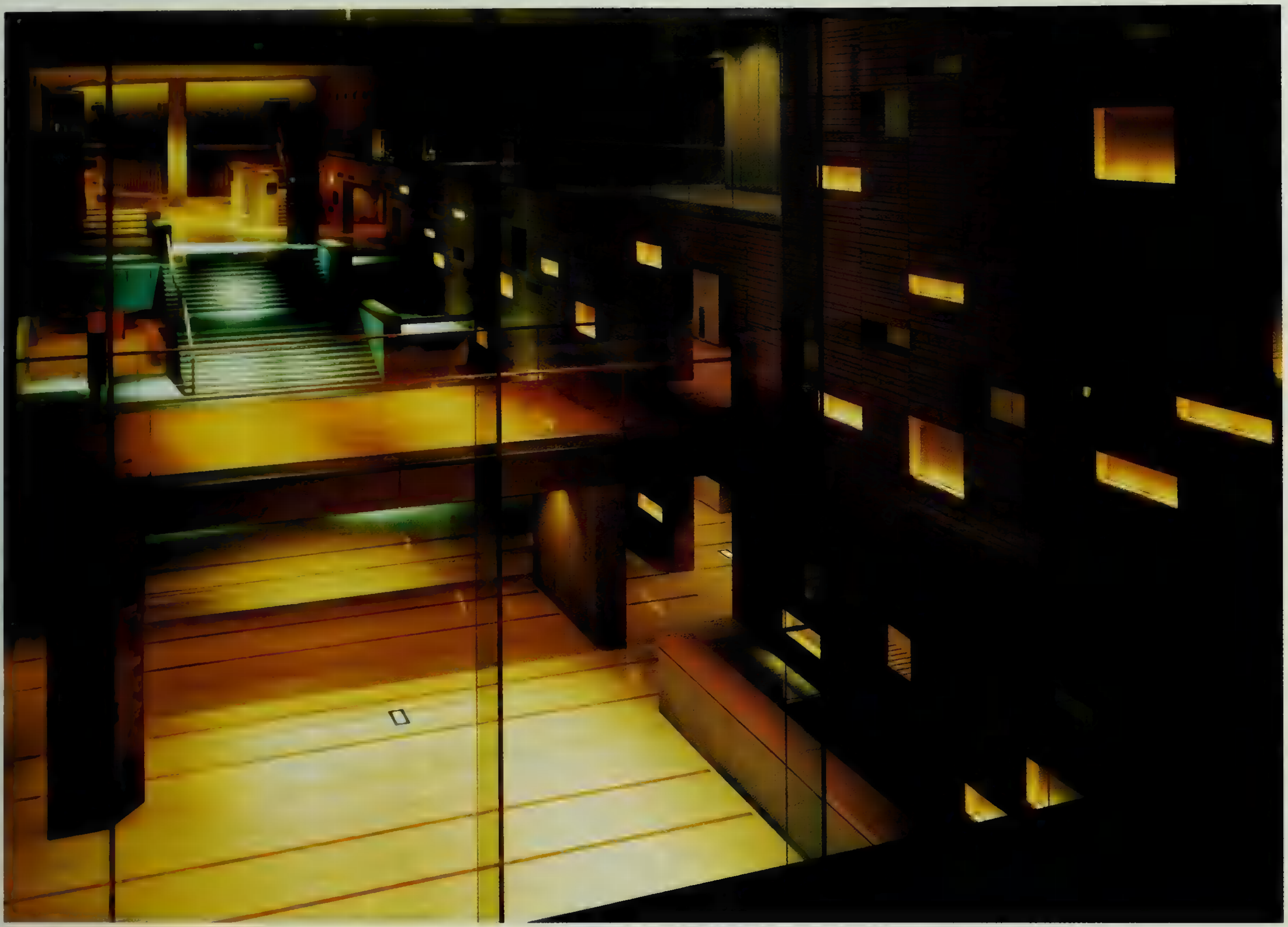
The editors of ARCHITECTURAL RECORD talked to Paul Marantz and Charles Stone about how they worked with Yanagisawa and about the design process that ultimately yielded the lighting for the New National Theatre.

**The New National Theatre in Tokyo, which occupies an entire city block, is the low-rise building in the foreground (right). Theatergoers enter through the plaza (above left).**

**Project:** *New National Theatre, Shibuya-ku, Honmachi, Tokyo*
**Client Organization:** *Ministry of Construction, Kanto Regional Construction Bureau*
**Managing Organization:** *Japan Arts Council*
**Architectural, Structural, and Services Design:** *Takahiko Yanagisawa + TAK Associated Architects*
**Associate Architect:** *Harald Deilmann (co-architect)*
**Consultants:** *Adolf Zotzmann (theater technology); Kisaburo Kawakami (design); Fisher Marantz Renfro Stone with TL Yamagiwa Laboratories (lighting); Leo Beranek (acoustical design); Shozo Motosugi, Hiroyuki Suzuki (theater planning)*
**Stage Equipment Design:** *TAK Associated Architects, Theater Engineering Institute, Nagata Acoustics*
**Stage Equipment Design Cooperative:** *Hashinosuke Kotani, Sumio Yoshii (overall design); Yasuo Okuhata, Motoi Hattori, Ikuo Mirofushi, Mutsumi Isono (lighting)*



The public lobby (this page and opposite) is the point of transition between the cold concrete of the exterior and the warmly lighted wood of the interior.



**RECORD:** Go back to the beginning of this project. What happened when you first met Takahiko Yanagisawa?

**Paul Marantz:** The job started when he arrived here in New York about eight or nine years ago. We took him on a tour of Lincoln Center. The New National Theatre was intended to be *the* Lincoln Center of Tokyo, the first real Western-style theater complex built there, and they wanted it to be one of the best theaters possible. So that was a natural starting point.

**Charles Stone:** I remember being in the New York State Theater lobby talking with Yanagisawa about how lighting ideas had changed over the years. Even after Modernism and the International Style, some of the basic rules first articulated by Richard Kelly still apply: you have to put light on the curtains and task lighting on the seats, to put focal glow on architectural features and materials. And you need sparkle. These are things you assemble one piece at a time.

**"EVEN AFTER MODERNISM AND THE INTERNATIONAL STYLE, SOME OF THE RULES FIRST ARTICULATED BY RICHARD KELLY STILL APPLY."**

**RECORD:** So you still follow some simple rules of lighting space, and you also get a clear understanding of what the architect's idea is. In this case it was very restrained and modern—and they work together.

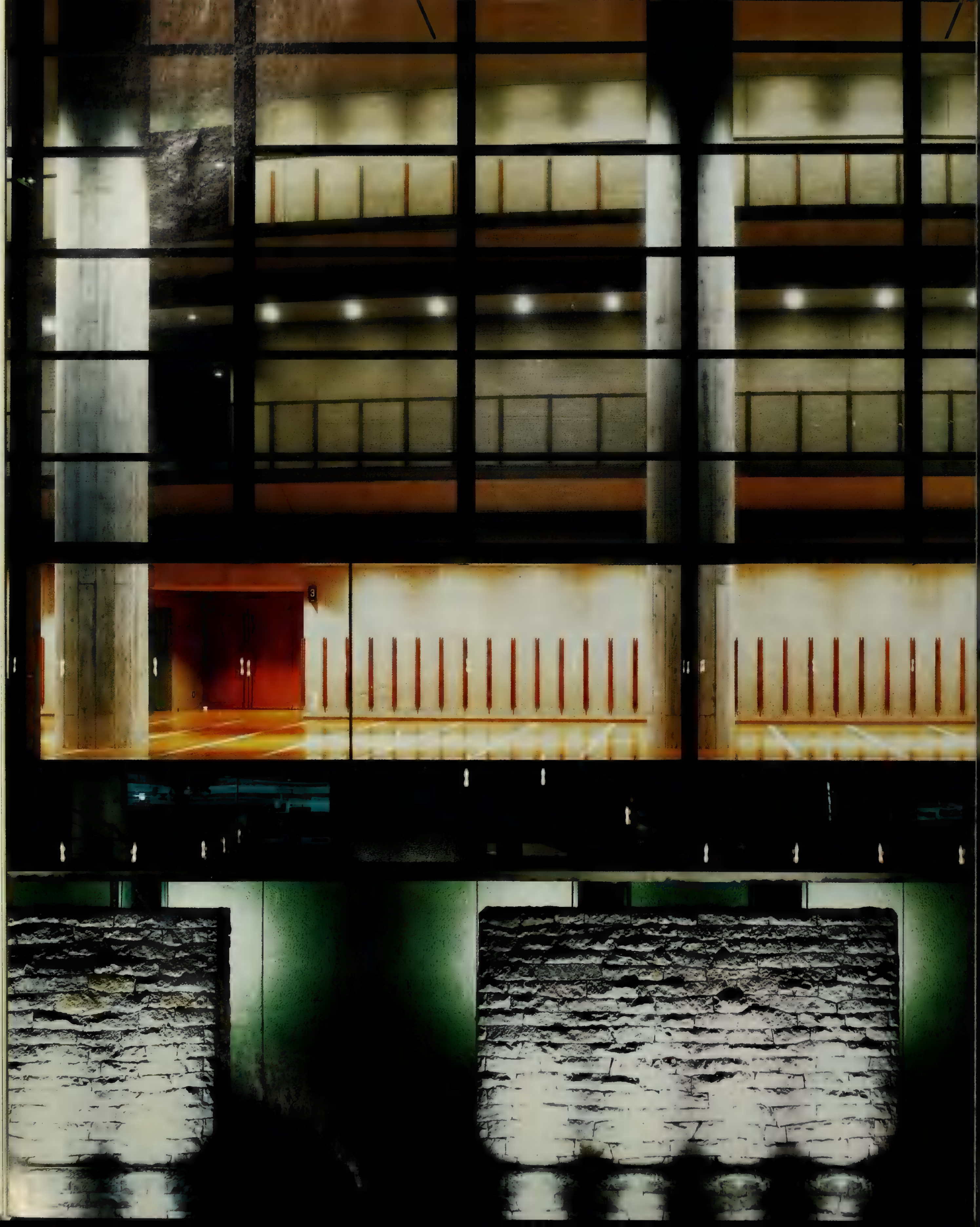
**P.M.:** Yes. The decoration was very restrained. It wasn't trying to be active. There are no chandeliers, for example.

**RECORD:** But one clear difference between the New National Theatre and Lincoln Center is that Lincoln Center is wide open—there is a plaza and you can see the whole thing at once—whereas the New National is very contained.

**P.M.:** That's true. It takes many steps to get from the public spaces to the theaters at the New National. And, whereas at Lincoln Center each theater building is distinct and stands out, the New National is just one extremely large public building. The first goal the lighting sought to achieve was to create a sense of the place. One of the most interesting design problems at the New National is in the main transitional public space, where you come in: there is a series of level changes, with some light boxes on the walls and three clerestories overhead. Yanagisawa's idea was that the sun would come through them and play in the space during the day, thus animating the area. We decided we should find an electric-lighting analogy to that. So we used the concrete beams that support the clerestories to hide very strong directional light sources. They nonuniformly light a set of stairs that moves you from the street up to the lobby.

**RECORD:** What role does the pool play in the entry procession?

**C.S.:** At the New National, you pass an incredible reflecting pool on the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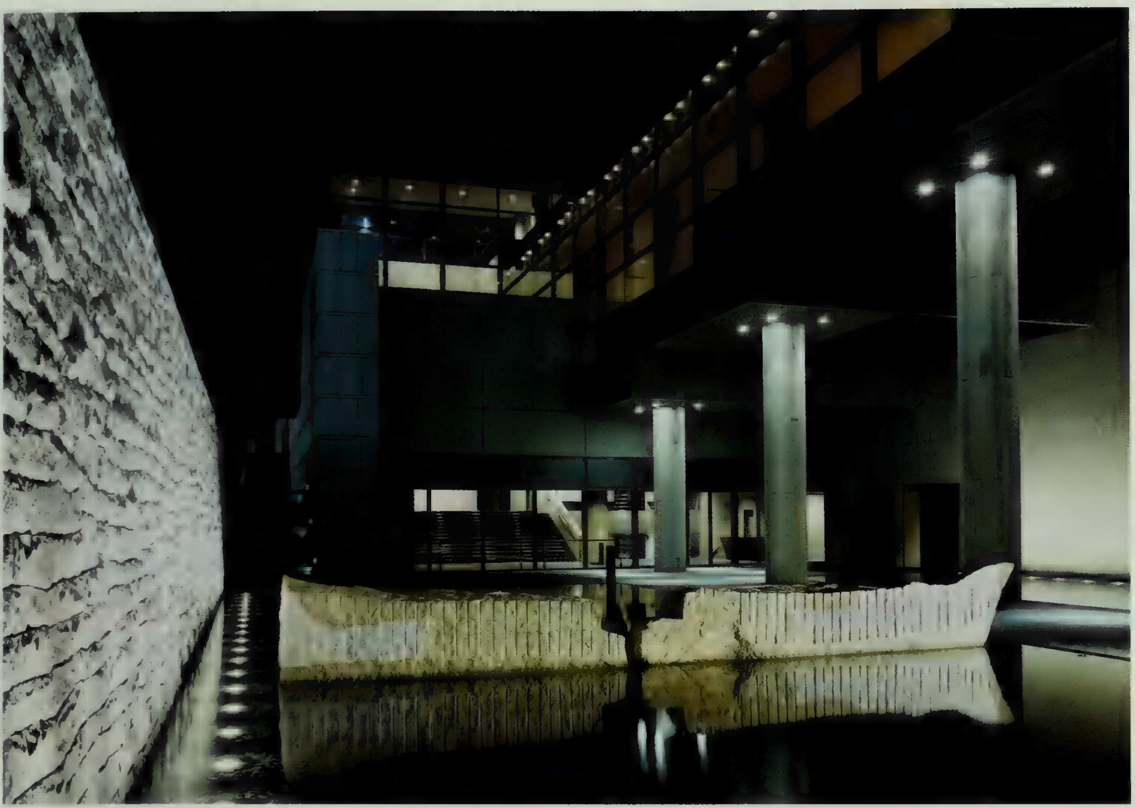
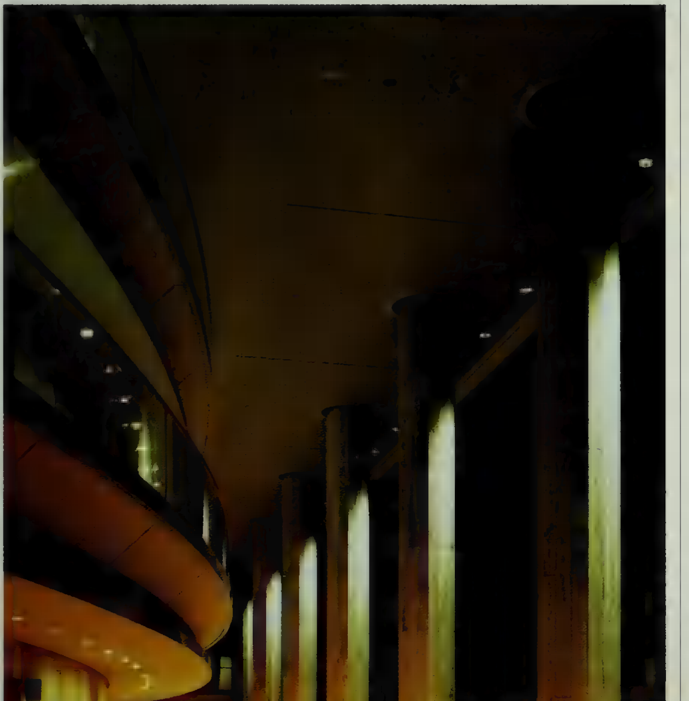
**A view across the reflecting pool (opposite) to the foyer outside the opera house shows how different planes are lit to create numerous layers between the interior walls and the exterior of the building. A view from within the foyer (below) shows how the columns are washed to give them a greater sense of depth.**

**Severe uplighting of the white stone wall in the black reflecting pool puts it in sharp contrast with the smoother, rusticated concrete finishes around it (right).**





way into the building. All the way around the pool, and on all three levels, there are places to stroll, so people are seeing and being seen. The pool is a calm, black mirror reflecting you and others. All the interior lighting and the rough stone forms sitting in the fountain are reflected and rereflected to create a composition. All the lights are on a dimmer, so the brightness can be adjusted to keep the glass transparent.

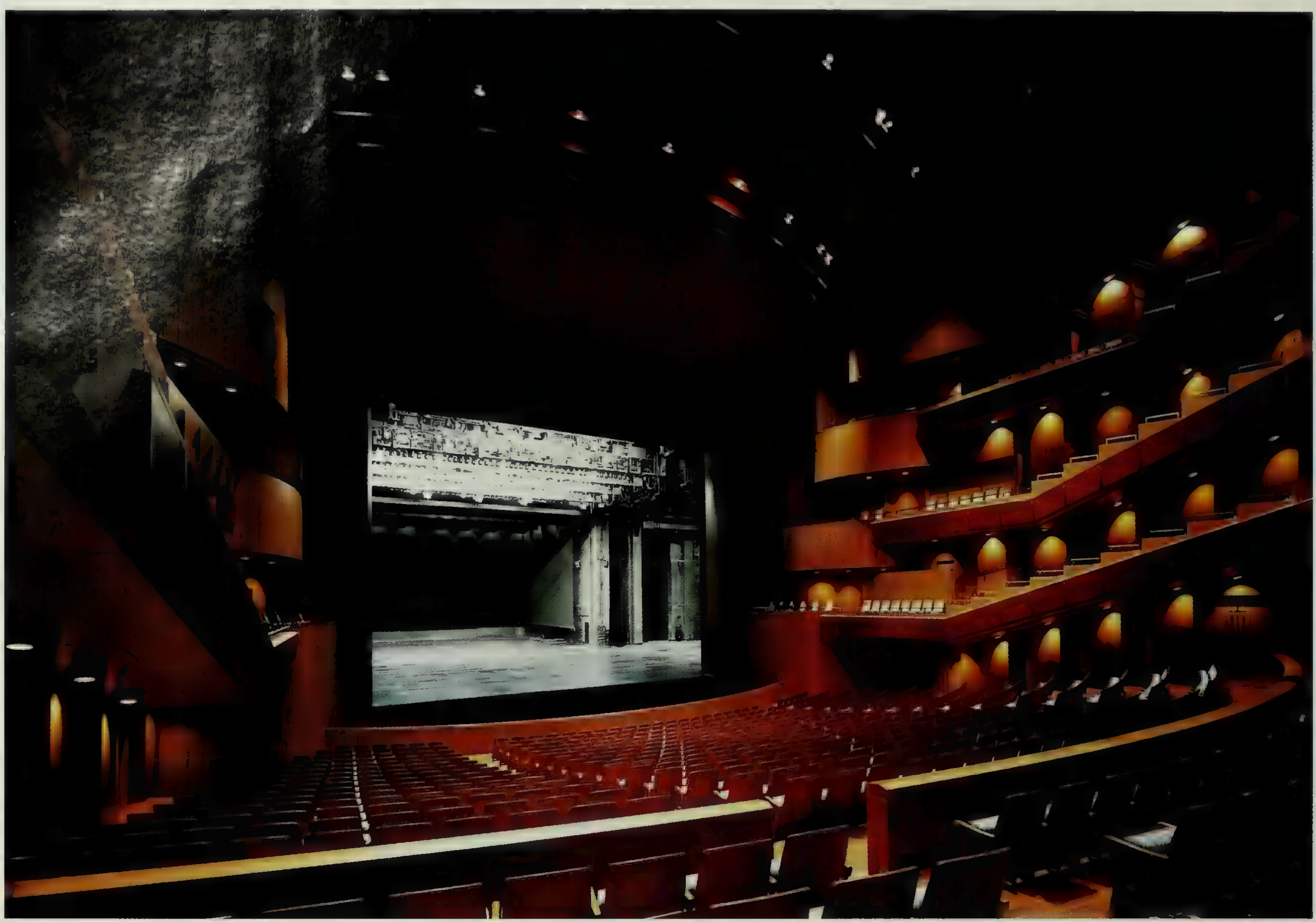
Inside, we decided that the columns looked good with a little bit of light, because it gave the whole space more depth. You really get a sense of that in the other lobby, where the light on the columns looks good, and there's a strong band of light on the curtain walls. It's very subtle. And then you get to the outside wall of the theater, which is washed in a very traditional, simple way.

**"YOU LOOK FOR THE HOOKS IN THE ARCHITECTURE THAT BEGIN TO INFORM THE LIGHTING SCENARIO."**

**RECORD:** So this, again, is a strategy of revisiting some of the classical principles of lighting.

**P.M.:** Yes, but also you look for the hooks in the architecture that begin to inform what the lighting scenario will be. The architect has created this story through form—about procession from the exterior to the interior, and from rough to smooth. So you latch on to the architectural clues to help you develop a design.

Of course, each surface requires a different plan of attack by the designer to coax out its texture and color. Ideally, lighting designers would hold off on designing anything until they really understand what a building is all about. In my experience, when I really understand the building, and its qualities resonate with me, then the lighting pretty much designs itself.



Any good building tells you how to light it. Sometimes I get in trouble with my clients when I can't find a solution to a lighting problem: I tell them nothing is coming to me because their building isn't good enough [he laughs]. The more perspicacious of my clients have generally agreed with me!

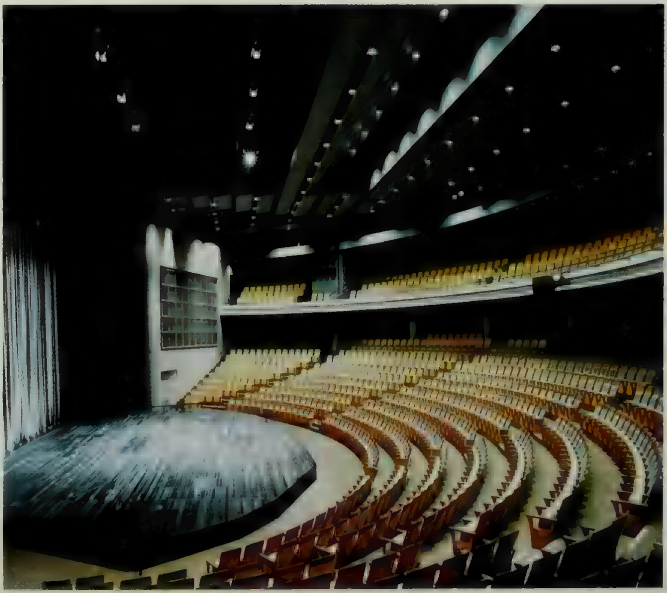
**RECORD:** When you look at a completed project, how do you measure its success?

**C.S.:** At the New National, some of the results were intentional on our part. Others were just a product of our office's lighting-design process. I look at a building, and certain effects make me say, *Yes, I remember. That's exactly what we wanted.*

We pay attention to volumes of space—where the people will be and what and where the materials are. We use light like paint, to coat surfaces and objects. Generally speaking, we aim to highlight the expensive and, therefore, higher-quality materials. You find a lot of clues in the space just by looking at where the expensive materials are. And, we try to be sensitive to the structure's alignments.

In the case of the New National, lining up lights with the centers of panels and joints and columns was a torturous experience, because the building's systems are so complicated, but it was worth the effort. Once you've succeeded at that, you kick the light up and away from the surfaces and objects you want to miss and use it to coat the surfaces you want to hit. If you've kept the progression of spaces in mind throughout the project, that's when you get results like these. ■

**The opera house's oak panels (above) have been given focal glow from wall washers. The playhouse (below) has wall washers hitting the balcony fronts; both houses' seating has task lighting.**



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Barbara Kristiansen, Lighting Designer
Light/Resource & Design, Inc., Rhode Island

Lighting designer Barbara Kristiansen knows the ultimate judge of her work is how well it functions. "I design within architectural and interior spaces to accent, reveal and illuminate. To me, dimming is crucial." Ms. Kristiansen also specifies Lutron lighting controls because of the quality of their technical support. "When you call with a question, you talk to an engineer; someone who can help you with even the toughest problems and give you *accurate* information. That's important to me and the electrical contractor."

Ms. Kristiansen also knows the importance of keeping her clients satisfied, so she appreciates the way "Lutron's aesthetic simplicity complements the surrounding environment" and how Lutron lighting controls save energy, extend lamp life, and add functionality to any location. As she says, "I know I can depend on Lutron. They're a superb company with a reliable, high-quality product. And for support – they really are the best I've found."

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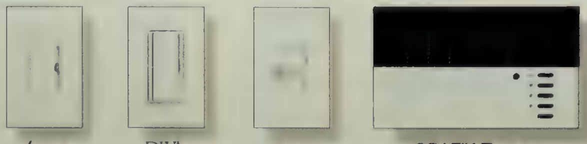

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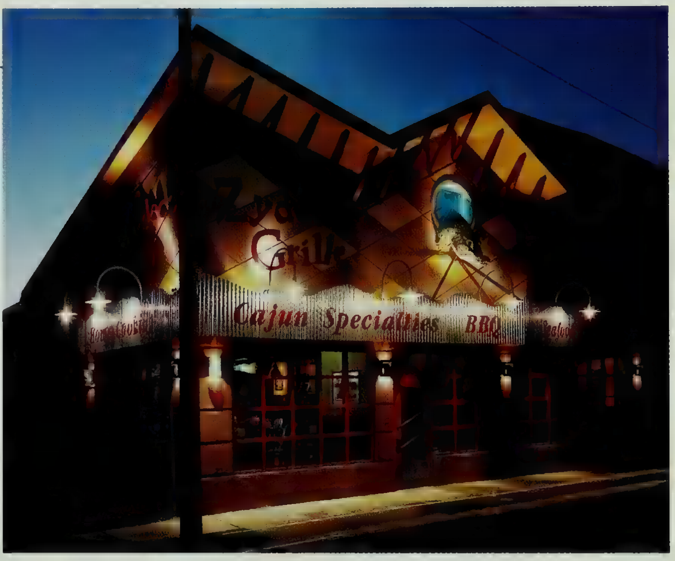
**CIRCLE 96 ON INQUIRY CARD**

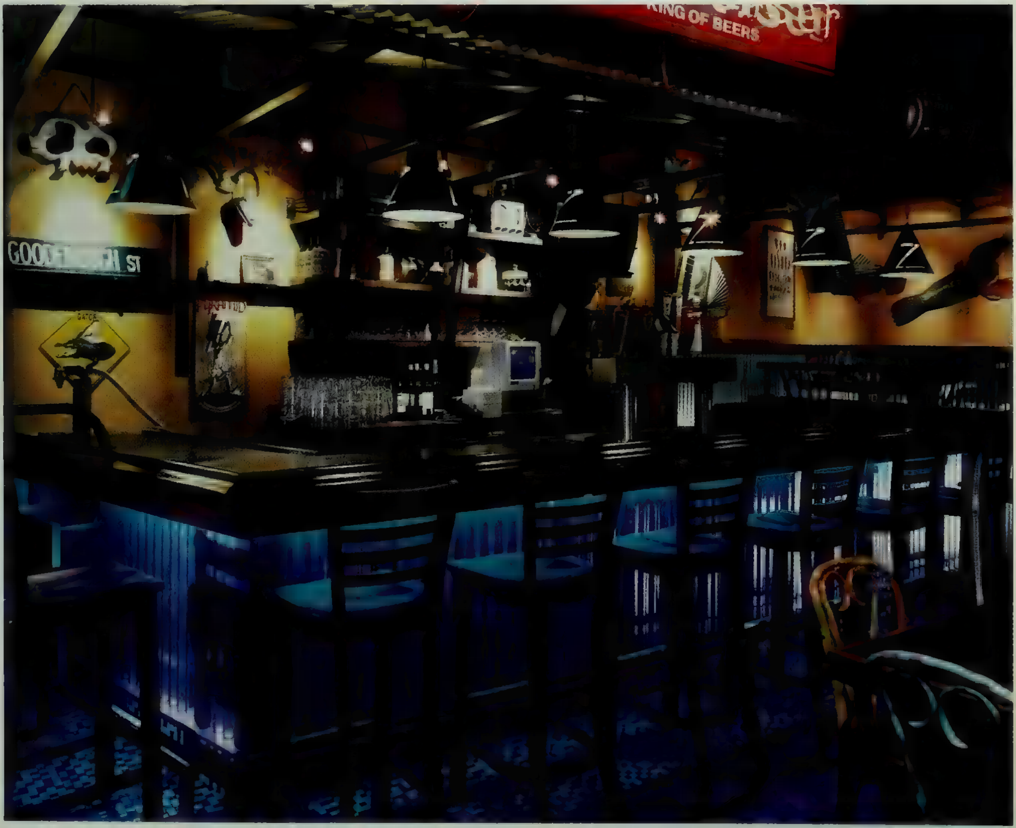
# Cajun Rhythms Inspire the Vibrant Lights of Zydeco Grille

**by Charles Linn, AIA**

The staccato of a rapidly pumped accordion and the slashing steel riff of a washboard are the elements of traditional Cajun music that inspired Doreen LeMay Madden's lighting design for the Zydeco Grille in South Boston. "I tried to create a rhythm and a sense of harmony with the lighting," she says. "I feel very strongly that lighting, like music, is a universal language. It has a certain psychology behind it, and it shows people how to respond to a space." The Zydeco Grille is intended to be as spirited as the Louisiana music that inspired it, and Madden's gaily layered illumination of the restaurant makes its message clear: *laissez les bons temps rouler!*

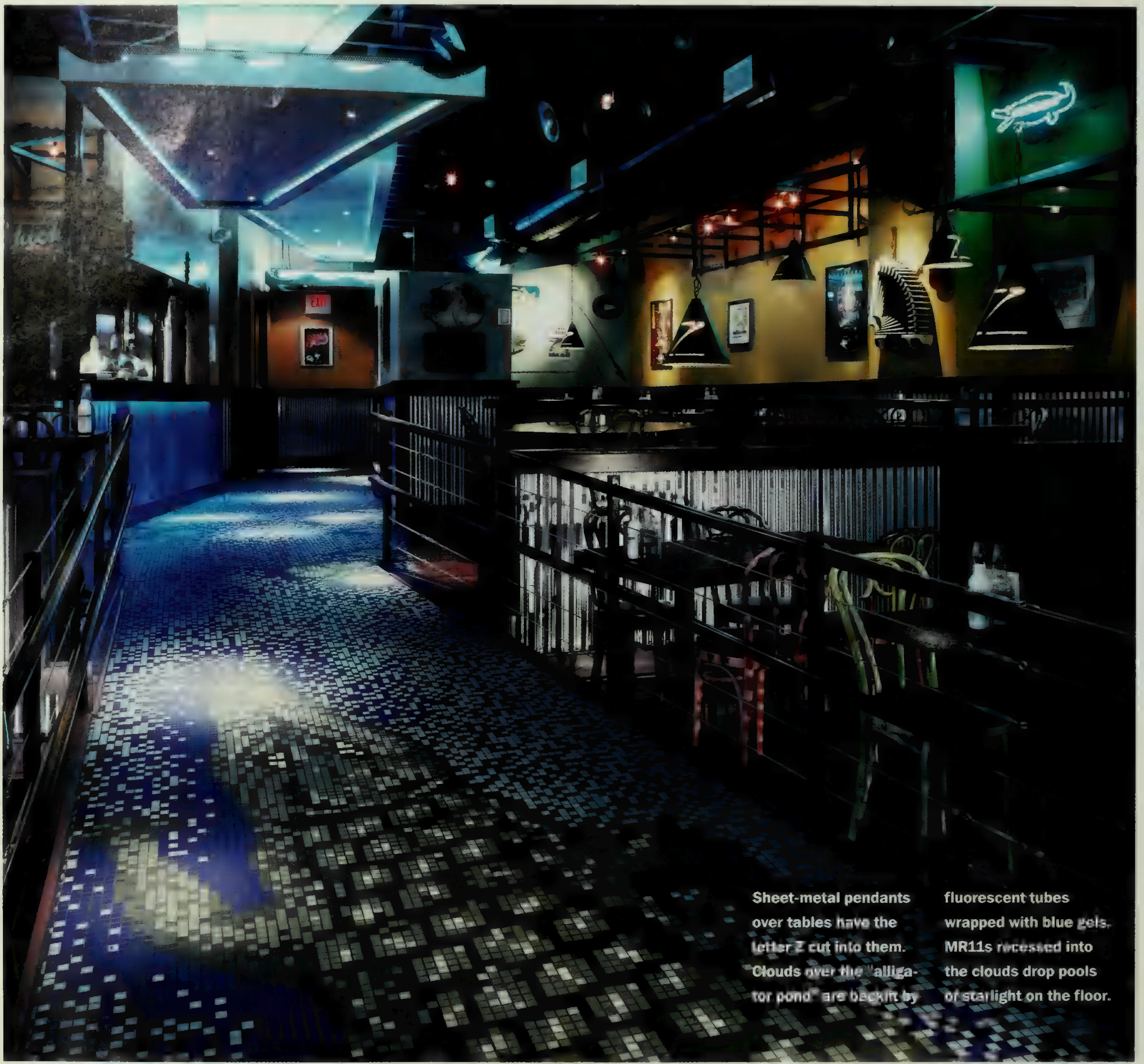
On the front and side of the building, PAR38 uplights and MR16 downlights are hidden behind a corrugated, galvanized-steel fascia. The uplights wash the upper portion of the facade and signage, the undersides of the eaves, and a menacing life-size wooden alligator that appears to be crawling out of a pool of blue neon. The MR16s wash the sidewalk below. Traditional gooseneck fixtures with wavy-rimmed





**The message Doreen LeMay Madden wanted to communicate with the layers of light in this replica of a tacked-together bayou bar is the same as that of Zydeco music: have fun! The underside of the bar is lined with intense horizon-blue neon, and the bar has custom pendants overhead. The walls, which are decorated with Louisiana artifacts, are bathed in light by a track of MR16s over the back bar.**

**Project:** *Zydeco Grille, South Boston*
**Owner:** *Jim Fagan*
**Architect:** *George Schnee Architects*
**Lighting designer:** *The Lighting Design Group, division of Standard Electric—Doreen LeMay Madden*



Sheet-metal pendants over tables have the letter Z cut into them. Clouds over the "alligator pond" are backlit by fluorescent tubes wrapped with blue gels. MR11s recessed into the clouds drop pools of starlight on the floor.

reflectors of galvanized steel bounce light onto the shiny fascia, and each column bears a custom-made sconce, with the letter Z cut out for the light to shine through.

On the interior walls, artifacts like a New Orleans street sign and a giant crayfish evoke the Bayou State, as does the "alligator pond," an overscale floor mosaic of one of the reptiles. Drywall "clouds" float over the pond, concealing 4100K fluorescent lamps wrapped in blue theatrical-gel material, which cast a sky blue across the ceiling. Recessed, chrome-trimmed MR11 downlights drop pools of light from the clouds onto the alligator mosaic, and the blue fluorescents shine through a slot in the bottom of each cloud.

To light tables and wash the walls, Madden put 12V MR11s on tracks around the perimeter. Away from the perimeter, black stem-mounted MR16s and cone-shaped, sheet-metal pendants with frosted G lamps are used to provide ambient light for the tables and the half-height corrugated-steel partitions that divide the dining area. The Z cutouts that first appear in the sconces outside are repeated in the pendants. Madden responded to maintenance concerns by limiting the number of lamp types to seven, and dimming controls were used to lengthen lamp life and enable light levels to be easily altered. ■

**Sources**

**Fluorescent strips:** *Columbia Lighting*

**MR11 downlights:** *Europhase*

**Interior Z pendants:** *Avalanche*

**Low-voltage MR11 track:** *Seagull*

**Exterior MR11s:** *Seagull*

**MR16 monopoints:** *Lightolier*

**Interior and exterior blue neon:** *Neon Williams Co.*

**Exterior floods:** *RAB*

**Recessed exterior MR16s:** *Lightolier*

**Wall-mounted goosenecks:** *Abolite*

**Exterior Z sconces:** *Ultralights*

**Exit lighting:** *Surelights*

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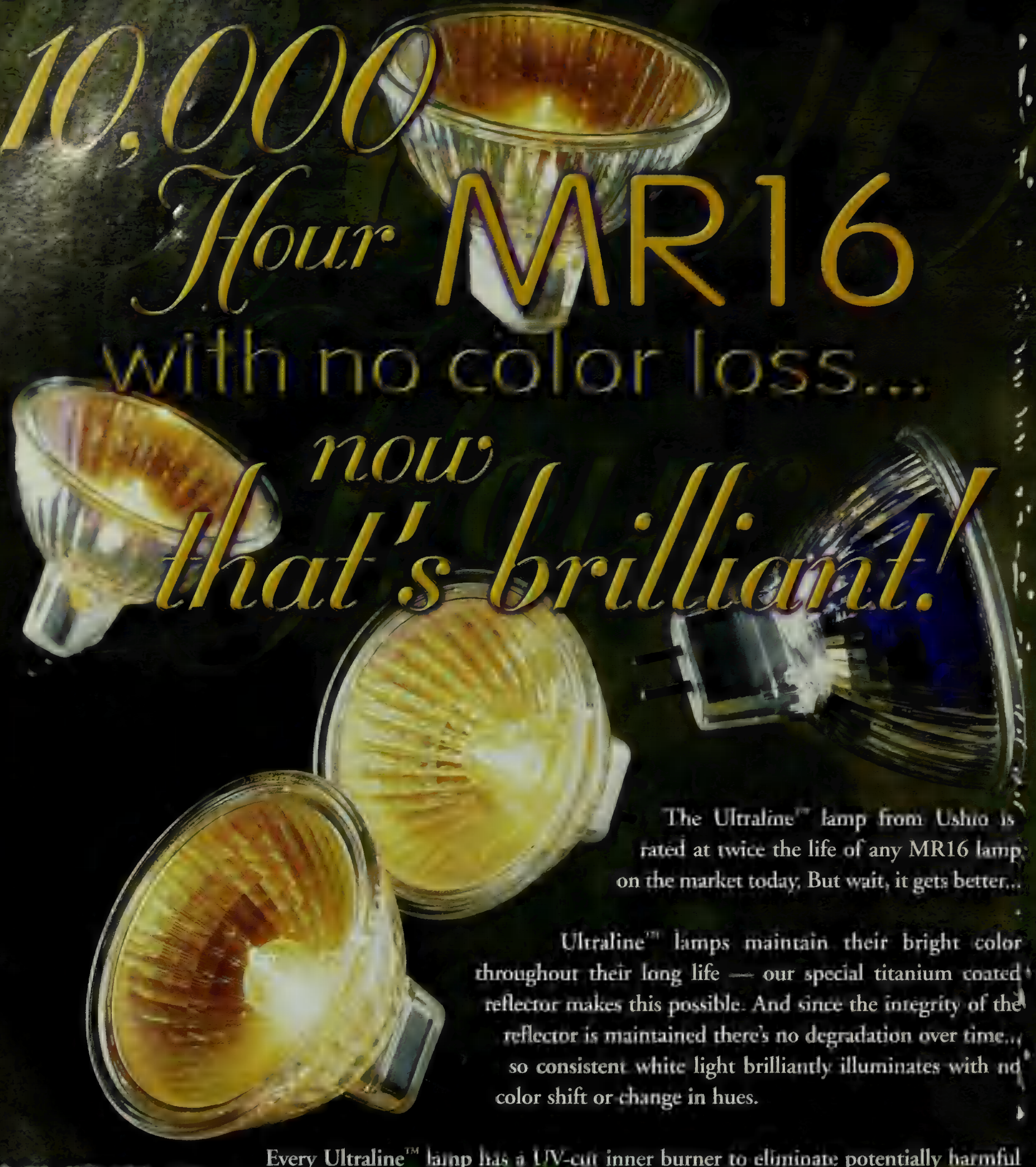

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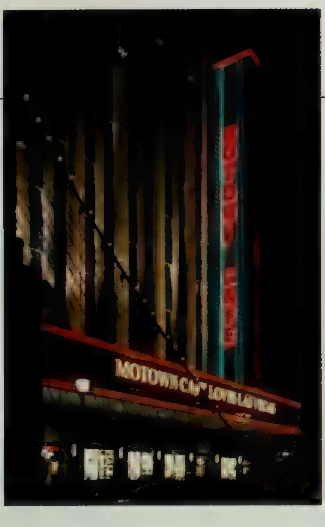
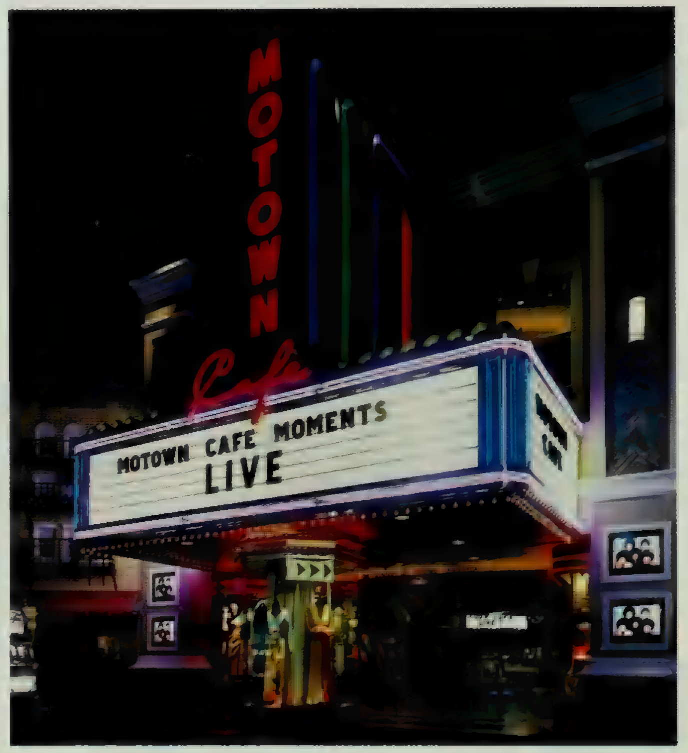
CIRCLE 98 ON INQUIRY CARD

# Radio City Meets Motown in Las Vegas Fantasy World

by Charles Linn, AIA





The Motown Café at New York New York Hotel and Casino in Las Vegas is behind a replica of Radio City Music Hall (above left). It is entered from the casino through a theater facade (above).

The popularity of themed architecture projects in recent years—especially those that present a carefully choreographed and sanitized rendition of the past—raises some intriguing questions about what, exactly, those who frequent them are looking for. How does an architect design for the person who would rather travel to Las Vegas to experience the Empire State Building and the Brooklyn Bridge than see the sights themselves in New York City?

To answer this question is to acknowledge that some of the experiences people really want cannot be had in New York City—or any other real place for that matter. Designers of themed restaurants and nightclubs combine evocative music, memorabilia, and food with other potent symbols and pack them into a box fashioned from architecture and lighting. What's inside is an idealized spin on the landmarks of Fantasy Land: all the wonders of Chinatown, for example, without the crowds and smells.

Founders of dream theme locales take eclectic license. The Motown Café at the New York New York Hotel and Casino sits behind a facade whose marquee and 50-foot-tall vertical sign bear an unmistakable likeness to those at Radio City Music Hall. Never mind that Motown is synonymous with Detroit. Visitors seem indifferent to whether or how the record label's identity and Radio City's appearance have been commandeered and conflated; they just come here to relive memories of the golden age of Motown or, in some cases, to have their first Motown experience—hold the reality.

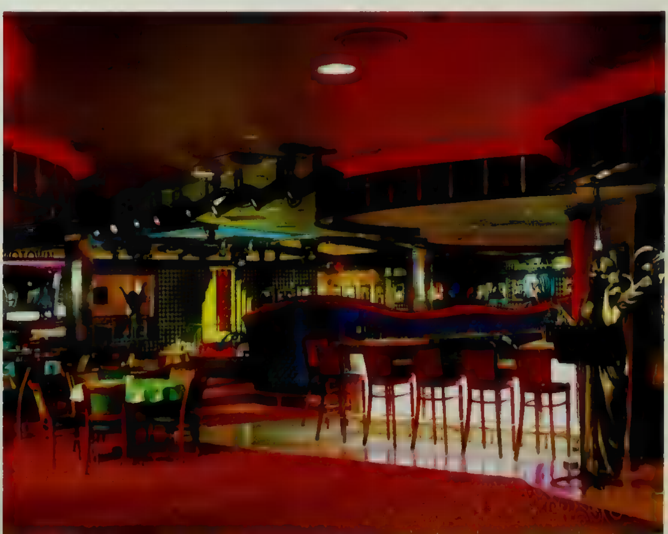
## Evoking a mood, a time, and a place

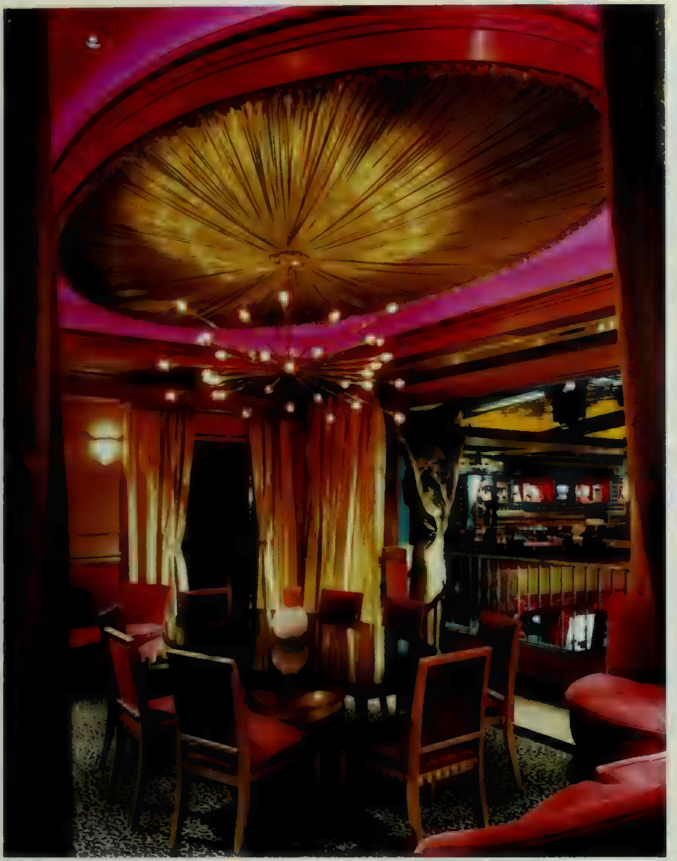
Jay Haverson, Motown Café's architect, says, "We wanted to evoke the colors—bright reds, yellows, purples, and pinks—and the styles of the early to mid-1960s, when the label was in its heyday. The message of the music was clean and wholesome, and the success of Motown signaled an exchange, when many white Americans first began accepting black culture. It was a powerful moment in time. This music said, 'Here's what we have in common: we all have tragedies, and we all get the blues.'"

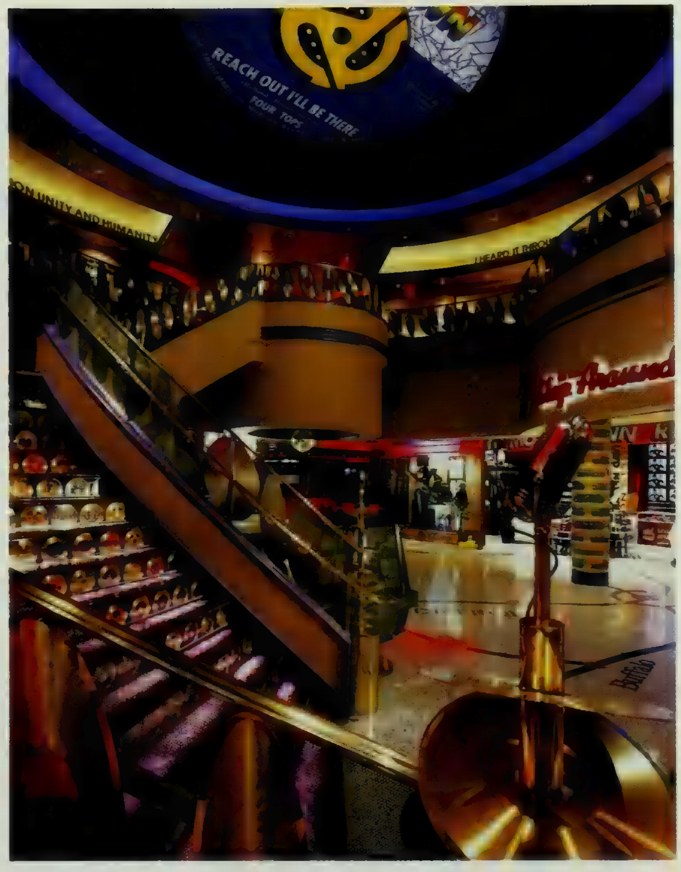
The lighting for the Motown Café was a substantial part of the project budget for one reason, says Haverson. "There is a lot of competition for people's money in Las Vegas, and people expect a restaurant to be over the top." Haverson divides the lighting he uses for themed architecture into three categories. The first is lighting that becomes a part of the event itself. To keep the Motown Café more like a stage show than a museum, people who work there wear costumes: hostesses in gowns reminiscent of those worn by performers of the 1960s direct patrons by way

**Project:** *Motown Café at the New York New York Hotel and Casino, Las Vegas*
**Architect:** *Haverson Architecture and Design—Jay Haverson, principal-in-charge; Carolyn Haverson; David Jablonka, project manager; Lisa Bianco, interior designer; Michael Gonzaga, Tim Koelle, Michael Kaufman, David Jimenez, Barbara Vazquez, Gina Librandi, Nick Lios, project team*
**Lighting Designer:** *Joe Kaplan Architectural Lighting Design—Joe Kaplan, Michael Gehring, Guy Smith, project team*
**Consultants:** *David Brewer (retail consultant); White Design (case design and memorabilia stylists)*
**Construction Manager:** *Peters Development*

The Twenty Grand Bar (above) and Main Bar (left and below) indicate the extent to which lighting has been employed to evoke a feeling of the 1960s. A focal point of the Diana Ross Room is a starburst pendant over the stairs (opposite left). 45-rpm records cover steplights on the Stairway to the Stars (opposite right).







of the Stairway to the Stars to the Twenty Grand Bar (the main dining room), to the Main Bar, or to mezzanine seating. The Motown Moments sing in various spots of the café, and their performance is also broadcast on video monitors. Theatrical light fixtures gelled in the classic stage colors of red, blue, and yellow are positioned to track the singers' choreographed routines—front- and backlighting them. "The experience is very three-dimensional," says Haverson. "The scenic lighting illuminates the show, and the actors and the guests are in a theatrical experience to begin with. That's part of what gives the space its richness."

## WHEN SUCCESSFULLY DONE, THE LIGHTING BECOMES PART OF THE EVENT.

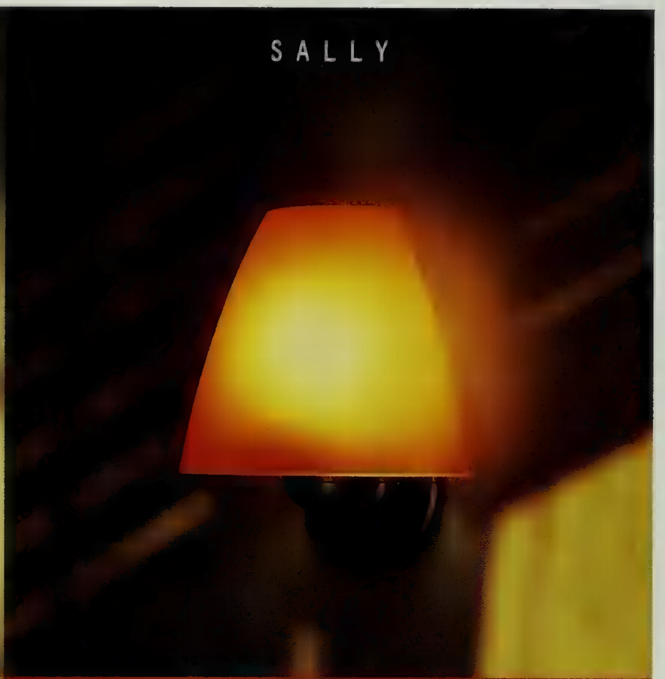
The function of Haverson's second category of lighting is to enhance the architectural form and objects in the space. This type of lighting abounds in the Motown Café: coved neon is layered in the brilliant shades of the '60s, which are reflected in plush pink-and-red banquettes, mint-green table linens, and golden draperies. Showcases containing memorabilia and statues of Motown artists, lit from above and below by incandescents, are the brightest objects in the restaurant.

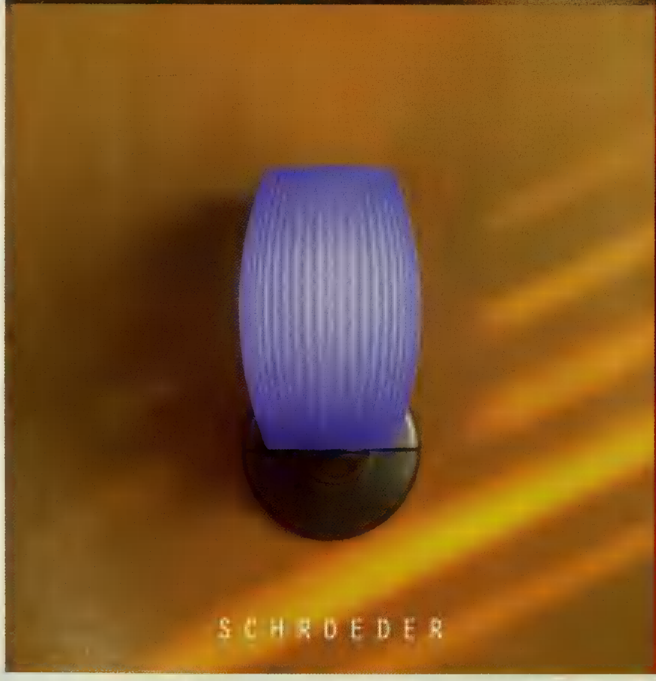
Other lighting that enhances the architectural form here is cleverly disguised. The MR16 pin-spots that illuminate dining tables, for example, are hidden inside gold record albums mounted on the vaulted ceiling; the albums are lit by uplights spaced around the mezzanine railing. Steplights illuminating the Stairway to the Stars are concealed behind golden discs that look like singles. Neon lights up the clear terrazzo footprints charting famed choreographer Cholly Atkins's "Temptation Walk," bringing the dance alive for patrons of the gift shop.

The third subset of lighting per Haverson is fixtures that become design elements in and of themselves, like sconces and chandeliers: "They do produce light, but they are really decorative objects." An exemplar of Haverson's third category—an ebullient starburst pendant of brass tubes radiating from a central point and terminating in globe-shaped lamps—is the key design element of the café's Diana Ross Room.

Whether those who dine at the Motown Café realize it or not, they are partaking not of history but of nostalgia. The Detroit nightclubs that the Motown Café has in part modeled itself on never really existed—yet their idealized versions are understood by all. Despite all the lights and equipment, however, this is not a time machine but a fantastic collage of cultural references. And the Motown Café does manage to take its visitors on a journey: a trip down Memory Lane. ■

**Sources**
**Incandescent downlighting:** *Lightolier, Halo*
**Wallwashers:** *Lightolier, CSL*
**Track lighting, monopoints:** *L.S.I.*
**Low-voltage strip display lighting:** *Ardee*
**Exterior facade uplight:** *Omegalux*
**Fluorescent marquee backlight:** *Lithonia*
**Neon lighting:** *YESCO*
**Roving exterior searchlight:** *Raztech*
**Chasing striplights:** *Celestial*
**Exterior downlight:** *Lithonia*
**Decorative fixtures at casino entrance:** *Lithonia*
**Fluorescent light in dressing rooms:** *Peerless*
**Decorative pendants:** *Sirmos*
**Blue jelly jars:** *Stoneco*





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**CIRCLE 99 ON INQUIRY CARD**

# Lighting for New Eastman Chemical Offices Is Economical and Effective

**by Charles D. Linn, AIA**

It is not unusual for an architect to be asked to add to or renovate an office building. What Eastman Chemical asked of Mark Freeman, AIA, however, was unusual: the Kingsport, Tennessee, manufacturer of chemicals, fibers, and plastics challenged Freeman to devise a plan to renovate its existing 109,000-square-foot office concurrently with the construction of a 176,000-square-foot addition, and make it happen with no employee downtime. Another goal was to improve the energy efficiency of the office task lighting while keeping down equipment costs.

At the same time, Freeman wanted to specify lighting systems that would win approval from the 51 department heads representing the 1,600 employees who would be working in Eastman's new center of operations. So Freeman called in lighting designer James Benya. "It might seem a little extravagant to have a lighting designer on a project that doesn't require complicated things like custom fixtures," Benya says. "But architects and engineers can still make good use of lighting-design services while keeping project fees affordable."

### Changing standards

Benya showed the design team alternatives to the company's standard low-brightness lighting fixtures for offices with computers. "Eastman's standard," says Benya, "was a typical fluorescent troffer fitted with either a specular plastic or aluminum parabolic louver. Millions of them are in use because they are inexpensive."

Benya proposed that the company consider an indirect fluorescent uplight fixture. Because indirect lighting bounces light off the ceiling, distributing it over large areas rather than toward the floor (as troffers fitted with plastic lenses do), it minimizes the veiling computer-monitor reflections that plague office workers. Indirect uplights can also be spaced farther apart than fixtures that have louvers, which control glare by cutting light off at a steep angle to the floor and may create a cavelike feeling in offices.

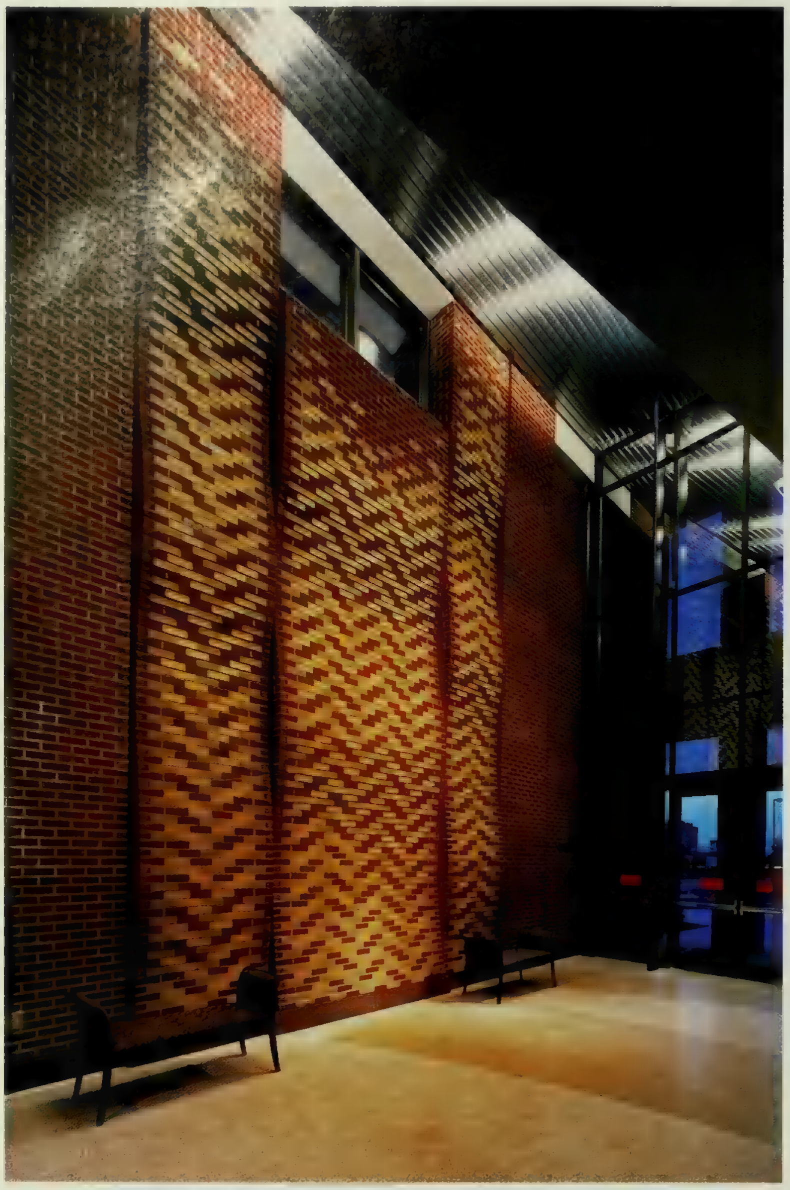
Most indirect lighting systems are constructed of precision-extruded aluminum, which makes them too costly to compete with troffer systems. Benya recommended an indirect lighting product made of rolled steel, which he felt would create a better-lit environment than a troffer system at a competitive price.

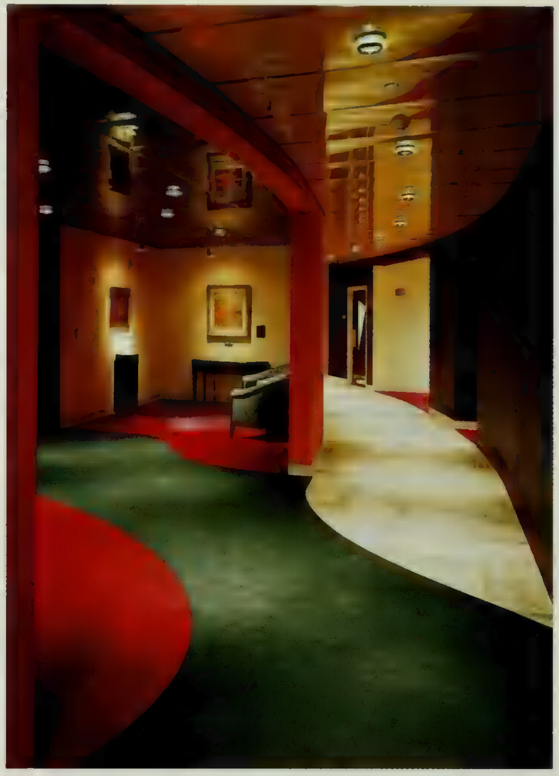
Before committing to any lighting-design scheme, representatives of Eastman decided to mock up a few sample work spaces, so employees could decide for themselves which system they liked best. They divided an entire floor of a nearby office building into thirds, and installed a different lighting system in each. One-third of the floor was outfitted with troffers, the second with an indirect system, and a third with a combination of the two. Employees were unanimous in their choice of the indirect system, which produced an average of 40 footcandles at the work surface.

Because indirect lighting can leave perimeter walls in the dark, fluorescent wall washers are often used to light vertical surfaces. But these fixtures can be expensive, so Benya recommended less costly one-by-four-foot troffers equipped with asymmetric "kicker" reflectors to wash the

**Eastman Chemical's new Business Center seamlessly combines an existing office building with a new one. The space between the old and new wings is flooded with daylight in a new atrium (left).**

**Project:** *Eastman Chemical Business Center, Kingsport, Tennessee*
**Project Manager:** *Richard Russell (Eastman Chemical )*
**Architect:** *Mark Freeman Associates—Mark Freeman, AIA, principal-in-charge*
**Lighting Designer:** *Pacific Lightworks—James Benya, principal-in-charge*
**Electrical Engineer:** *West, Welch, and Read Engineers*
**Electrical Contractor:** *Tennessee Electric Company*





**Track lighting floods a brick feature wall (above) and artwork in a waiting area (top right). The reception area is lit by halogen downlights with decorative trim rings. As part of the renovation and expansion, Eastman adopted indirect fluorescent (bottom right) as its new standard method for lighting office space.**

walls where they meet the ceiling. "Possibly the most important work that the design team did," says Benya, "was to help change the company's office lighting standards. We took them from troffers to indirect fluorescent—that's a major change."

The design team went to a manufacturer's training facility to see fixtures in use before they chose luminaires for other parts of the building. They selected two-by-two-foot parabolic troffers for ambient illumination in conference rooms as well as circulation areas and other shared spaces. Architectural-grade compact fluorescent downlights and parabolic troffers were chosen for offices. In the public spaces, halogen downlights with decorative trim rings pick up the gleam of polished-metal ceiling panels, and incandescent track lighting is used to illuminate artwork.

An atrium of glass and specially commissioned bricks serves to link the new and old wings of the building visually as well as physically. As floors in each section were completed, 50 to 100 employees were moved in at a time, generally over weekends to minimize downtime.

Two years after the project began, 1,600 employees were ensconced in new work spaces, and Eastman Chemical's business operations had been consolidated from eight locations into one. The overall operating electric load for the lighting systems was reduced from 3.5W per square foot in the old facility to 1.2W per square foot in the new facility, with no loss in illumination at the work surface. ■

**Sources**
**Indirect uplights:** *Finelight*
**Parabolic troffers:** *Metalux*
**Fluorescent downlights:** *Halo*
**Exit and emergency lighting:** *Surelites*
**Halogen downlights:** *Halo*
**Incandescent track:** *Halo*
**Parking lot lighting:** *McGraw-Edison*

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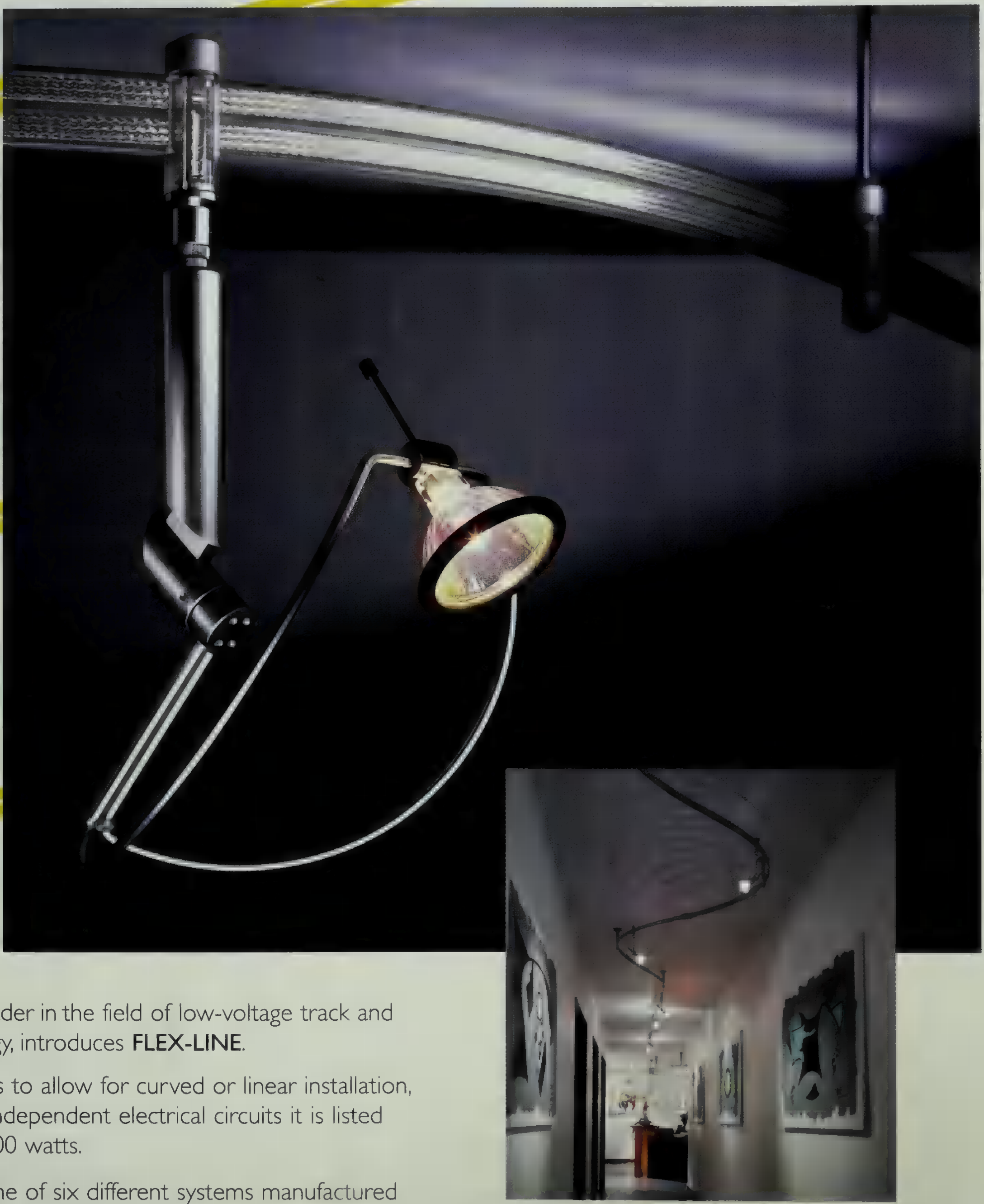

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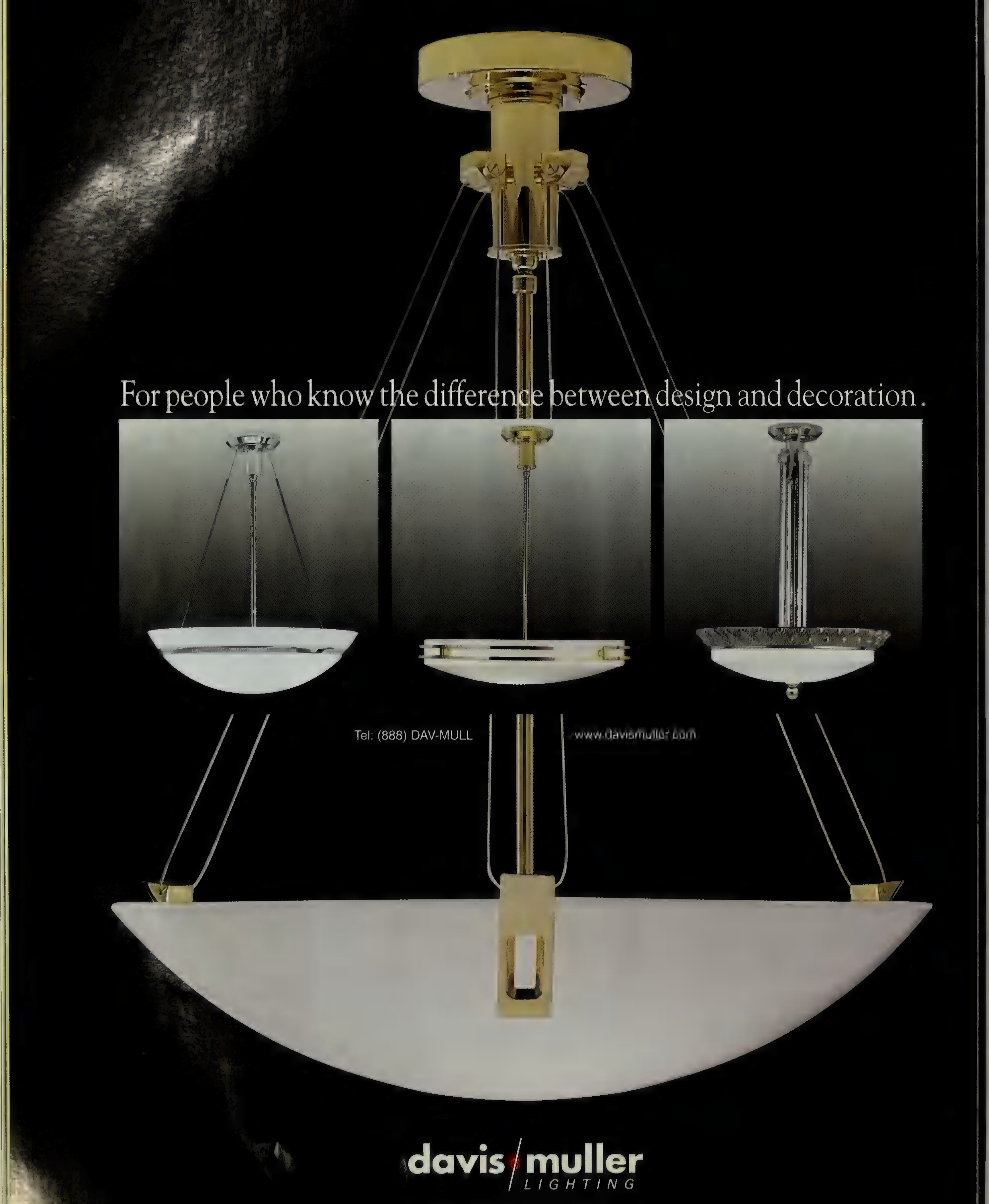
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CIRCLE 102 ON INQUIRY CARD

# Reassessing the Value of the High-Pressure Sodium Lamp

**by James Robert Benya**

High-pressure sodium (HPS) lamps, the ubiquitous golden-white light source, are the darling of public works engineers, who have installed them in more than 90 percent of all roadway lighting fixtures in the United States. You can find them in the decorative acorn fixtures in almost every redeveloped downtown area as well as in warehouses, industrial work spaces, building and monument floodlighting, and airport terminals. They are everywhere.

From the moment they were introduced in the 1960s, HPS lamps became the light source of choice for applications requiring high-intensity discharge lighting. Heavily advertised as the replacement for mercury vapor in applications where color quality was apparently of no concern, HPS lamps quickly became recognized as the most energy-efficient, long-life light source available.

During the energy crisis of the 1970s, HPS's popularity soared. The technology was rapidly applied—and misapplied—across the nation. In the mid-1970s, newspaper reports began to appear linking the HPS lamps installed in grade-school classrooms to save energy with instances of headache and nausea in children. While there was no explanation for the phenomenon, the specialty fluorescent lamp industry took advantage of it to promote "full-spectrum" lighting. Many HPS installations were changed back to fluorescent systems, and the children's symptoms disappeared.

In the 1980s similar problems showed up in industrial applications as mercury vapor or fluorescent systems were changed to HPS. In one case, a major automobile manufacturer's workers complained that under HPS light they had trouble reading fine print and doing detail work; in spaces with mercury vapor light, they said, even at lower levels they could see well enough to perform the same tasks easily. In another case, a manufacturer had to remove an HPS retrofit and replace it with a high-output fluorescent system to prevent a union walkout after workers complained of nausea and disorientation.

**High-pressure sodium light turns clouds of steam that are white during daylight hours to a golden-yellow color at night.**

### What's wrong with HPS?

Much of the explanation rests in the human eye's response to the visible spectrum. In photopic vision, commonly called day vision, where there is plenty of light, a great deal of information is provided to the cones of the eye. Cones are concentrated around the fovea, or focal point of the retina, and in normally sighted individuals they are sensitive to a full range of colors and send visual signals to the brain at high resolution. At high illumination levels such as those during the day, the eyes depend primarily on the cones to perform detail-oriented tasks like reading. The cones' peak response comes at 555 nanometers (nm), where the light is yellow. This is perfect for sodium sources, whose average peak output is at approximately 580 nm.

In the dark, the cones are almost useless, and most visual information is sensed by the rods. The rods, which are located everywhere around the retina except for the fovea, are responsible mostly for peripheral vision. Rods provide low-resolution black-and-white images but are much more sensitive to light than cones and are especially good at detecting motion. The rods produce scotopic vision, or night vision. But rods are sensitive to different wavelengths than cones. Their peak sensitivity occurs at 507 nm, well into the blue region of the spectrum. The change in peak sensitivity from the cones' yellow to the rods' blue is called the Purkinje shift. Rods do not respond very well to yellow light. Whereas the HPS peak yellow light excites cones to around 90 percent of their peak output, it excites the rods to only about 10 percent of their peak output. It has long been known that lower lighting levels cause an increasing reliance on rods and, therefore, change the effective spectral response of the vision system.

People always sensed that there was a problem with HPS light. And it was easy to blame the color, which HPS aficionados call golden or gaslight, although HPS is really a very poor color-rendering source. But the problems weren't just with bad color.

The first clues were revealed in the work of Dr. Sam Berman and

*James Robert Benya, FIALD, FIES, is a principal at Pacific Lightworks, located in Portland, Oregon.*

his colleagues at Lawrence Berkeley National Laboratory (LBNL) in Berkeley, California. Berman reported improved visibility at low lighting levels when sources rich in blue light were used. Among the findings Berman reported through the 1990s was an exaggerated dilation of the pupil for a given light level when a blue-poor source was used. In "Bluer Light, Better Sight" [RECORD, February 1991, page 83], I reported that Berman had proposed a correction scale to help account for the improved visibility caused by these bluer light sources.

On this scale, HPS compared poorly to other sources. Later, a demonstration booth built by LBNL allowed people to experience the phenomenon of scotopically enhanced light. It showed that human vision could actually be improved by adding bluer light to the spectrum even at indoor task-light levels. In other words, the rods could be made to respond to light and contribute to visual acuity at much higher levels than anyone had previously imagined.

More evidence to support these findings has been found in the years since Berman's experiment. In 1995, Dr. Mark Rea and his colleagues at the Lighting Research Center (LRC) conducted experiments to determine whether the differences in visual response between metal-halide outdoor lighting and HPS could be measured. In a paper with dramatic implications, the LRC reported that peripheral vision was 50 percent better with metal halide than with HPS, when both were at equal, ordinary, parking-lot-lighting levels. Since visibility tends to change only a small amount for relatively large changes in illumination, the finding that such a high increase in visibility could be achieved simply by changing light sources was extraordinary.

There is an unmistakable correlation between LBNL's work and the LRC's findings. Spectrum does make a difference in human vision. The blue portion of the spectrum, which is abundant in sun-, moon-, and starlight, is needed for the proper function of the human eye, and it appears that its importance to a person's vision increases as light levels decrease. Blue-deficient light sources like HPS do not provide the same amount of visual stimulation as sources that produce spectra rich in blue.

The impact of this revelation is profound. The lumen, the basic measurement of light quantity used in all lighting calculations, is based on the photopic, or day-vision, curve. But at lower light levels, the color of

## COMPARISONS USING GRENALD'S CONSTANT

**In concept, light** measurement and the methods of calculating levels of illumination are not very difficult. For example, the standard measurement of illumination on a surface is expressed in footcandles: if one lumen of light falls uniformly on a one-square-foot area, the illuminance is expressed as one footcandle.

However, what the eyes actually see when viewing light reflecting off a surface is not explained so simply. The percentage of light falling on a surface that is reflected is referred to as the reflectance factor. Reflectance factors are not corrected for the color of the light falling on an object or the hue of the object itself. When a monochromatic light source, such as a red light, falls on an object whose color does not reflect that particular wavelength, the eye is not stimulated, and the object appears black. To take this one step further, light that has an incomplete spectrum falling on a polychromatic object will result in a distortion of some of the colors—some will appear dirty, muted, or grayed out, while others will turn black.

A typical footcandle meter measures the light that is falling on a surface, and while it is corrected for the eye's assumed spectral sensitivity, there is no built-in correction for variations in the spectral distribution of different light sources. Furthermore, the meter can't be adjusted to compensate for the color of the object being illuminated. In many situations the meter will tell you that an object is reflecting more or less light than it appears to be; if you believe the meter, you must disbelieve your eyes. Which should you believe? What your eyes tell you, or what an instrument indicates?

As an experiment some 20 years ago, I illuminated one side of my office with cool-white fluorescent lamps, which produced 3,150 lumens. I illuminated the other half with deluxe cool-white lamps, which produced 2,200 lumens. After six months I quizzed my staff, who had been unaware of the experiment, as to their preference. They were unanimous: the side with the deluxe cool-white-lamps was brighter—a direct contradiction of what the footcandle meter measured.

When I compared other light sources, such as high-pressure sodium and metal-halide lamps, I discovered an interesting relationship that seems to predict—more accurately than a light meter could—how the eye will respond to a given light source. It is derived through a simple formula, which I call Grenald's Constant, that seems to be applicable to virtually all light sources. Where lm/W equals the lumens per watt (as provided in lamp manufacturers' catalogs); CRI equals the color-rendering index, a measure of spectral quality as compared with a standardized light source (also available from lamp manufacturers); and RV is a number I have named "relative visibility," as perceived by the human eye: lm/W x CRI = RV.

One problem with this simple formula is that the eye-sensitivity curve currently in use is only a studied approximation. It is inaccurate because it doesn't take into account that the sensitivity of the eye varies with age and several other factors, objective and subjective. Therefore, the relative visibility figures below are significant only relative to each other. (For the sake of simplicity, ballast loads have not been included in the thumbnail calculations.)

**180W low-pressure sodium:**
**183 lm/W x 3 CRI = 550 RV**

**400W high-pressure sodium:**
**140 lm/W x 22 CRI = 3080 RV**

**40W T12 cool-white fluorescent:**
**76 lm/W x 62 CRI = 4790 RV**

**40W T12 deluxe cool-white fluorescent:**
**55 lm/W x 89 CRI = 4895 RV**

**400W metal halide:**
**100 lm/W x 70 CRI = 7000 RV**

**32W T8 high-efficacy high-CRI fluorescent:**
**89 lm/W x 82 CRI = 7300 RV**

In spite of metal halide's higher lumen depreciation in comparison to that of high-pressure sodium, these numbers still favor it. My firm has found that when we replace high-pressure sodium lamps with metal-halide lamps of equal wattage, the relative visibility increases despite the decrease in measured levels of illumination. The bottom line is that for interior work, we can design with lower levels of illumination when we use higher-color-rendering lamps. But don't take my word for it. Do your own tests, and draw your own conclusions. *Raymond Grenald*

*Raymond Grenald, FAIA, FIALD, FIES, is principal of Grenald Waldron Associates in Narbeth, Pennsylvania.*

*Shown with optional accessory cartridge.*

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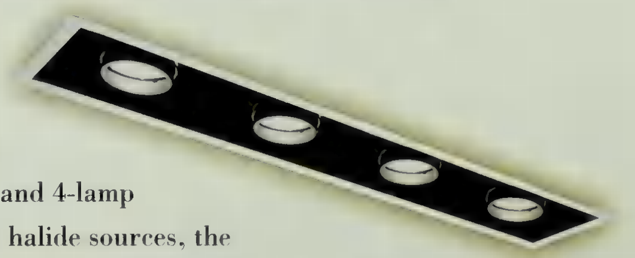

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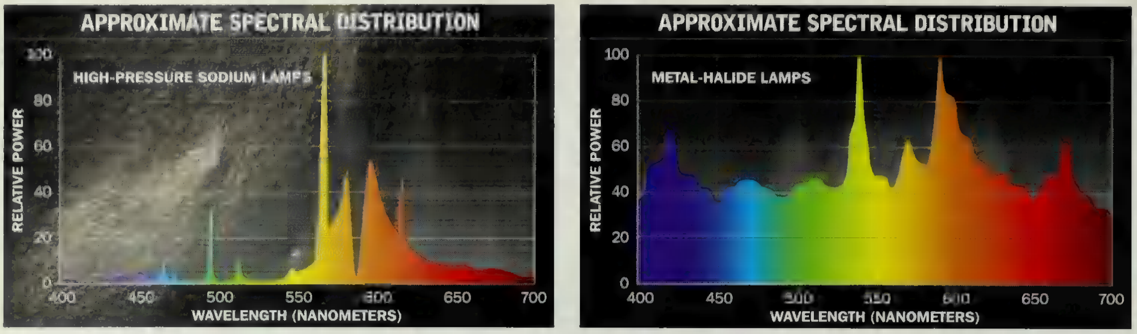


**The spectral distribution of high-pressure sodium (far left) is very low in blue but comparatively rich in red and yellow. Metal-halide light (left) contains a much greater quantity of blue.**

the light has a greater influence on vision than the quantity of light. Therefore, everything based on lumens becomes questionable or incomplete, starting with typical indoor light levels and decreasing to almost total darkness. Footcandles and lux are suddenly no longer complete measures of light as it relates to human vision. Neither are other common measurements, such as luminance or brightness. And if a metal-halide source stimulates the eyes better at low light levels than HPS, even source efficacy, the energy efficiency of a light source as measured in lumens per watt, becomes invalid.

This suggests that there is a need to revisit the entire scientific foundation upon which we base lighting standards, design, and measurement in the mesopic (twilight vision) and scotopic regions. Berman, Dr. Alan Lewis of the Michigan College of Optometry, in Big Rapids, Michigan, and others have developed proposed scotopically corrected factors for various light sources. Not surprisingly, sodium-based sources are inferior to most other sources.

**RESEARCH SUGGESTS THAT WE A NEED TO RETHINK THE VERY BASIS OF HOW WE MEASURE LIGHT QUANTITY FOR SCOTOPIC VISION.**

Because of the eye's poor rod and peripheral-vision response to HPS, this type of lighting may be unacceptable in many of the places it is traditionally used. It certainly explains what has prompted those who operate parking lots and garages in the retail and gaming industries to replace their HPS with metal halide. When people can see better, they feel safer. One can only wonder what the implications of vastly improving the peripheral vision of people who drive at night might be.

At higher levels, HPS's blue deficiency appears to cause problems with task visibility. Workers can't see detail because they have trouble focusing on the task. This can be explained by using a simple analogy comparing the way the pupil works to the mechanics of a camera lens. Berman showed that the human eye's pupil dilates much more when it is viewing an object under HPS light than it does when viewing surfaces under bluer sources. This is true even though the scene illumination is identical. The pupil is acting like the aperture of a camera lens—the wider the lens aperture, the shallower the zone of sharp focus. It can be assumed, then, that using HPS to light fine work is a questionable practice.

But neither the night-vision deficiency nor the focusing difficulties of HPS explain the instances of illness in schools and industrial facilities. Those were caused by the flickering of the light source. In each of these cases, HPS luminaires were used in relatively small spaces—small enough for all the lighting to be powered from one branch circuit. High-pressure sodium lamps exhibit the greatest flicker of any normal light source, and all of these luminaires were on the same phase, flickering in sync. The result was that the environment took on a stroboscopic effect, which can cause people to become ill.

Based on the evidence to date, there are literally millions of locations lit with HPS that would be better served by other light sources, or at least by the addition of task lighting. In many instances where HPS has been used, designers should consider other options: metal halide, fluorescent, compact fluorescent, electrodeless fluorescent, and even the sulfur lamp are all energy-efficient alternatives that offer long life. "White" HPS lamps are very different from standard HPS lamps: they lack the long life, high efficacy, and other qualities that made HPS so popular.

Should HPS lamps be eliminated? Of course not. There are plenty of locations where their deficiencies aren't an issue, such as unused outdoor areas, storage yards, warehouses, and floodlighting for building exteriors.

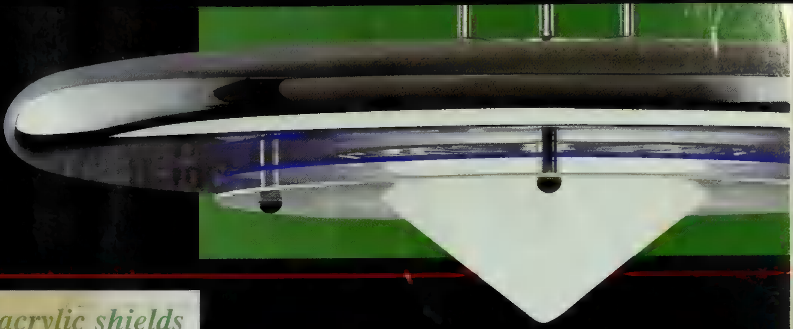
Low-pressure sodium (LPS) lamps, which produce bright yellow light like the incandescent A-lamps that are used to repel insects, have their own problems. They are considered to be a monochromatic source because they produce no color except yellow, and compared to HPS, they are far worse for night vision. But LPS is aggressively supported by astronomers and has become mandatory in some American cities and counties because its rays don't interfere with viewing the sky through telescopes. Limits on unshielded light sources, hours of operation, and even lighting levels all make sense in meeting astronomers' needs to minimize light pollution, but requiring the use of a light source that limits visibility and peripheral vision in a way that significantly affects safety and security is no longer justified.

### How did HPS gain such wide acceptance?

Many will wonder why lighting designers and manufacturers didn't perceive that there were problems with HPS long ago. At the time it was introduced, HPS was a real improvement over mercury vapor in lamp life, efficiency, and cost, and there were no practical alternatives. HPS entered the mainstream very quickly. It is also important to consider that one cannot easily "see" the problems discussed here. On the other hand, if lighting research had been better funded when HPS was gaining in popularity, perhaps knowledge of its fatal flaws would have spurred manufacturers to develop alternative sources.

There are still many challenges ahead for those involved in lighting research—it is a serious problem that basic lighting science doesn't address how the eye sees light at low levels. And there is a great need for establishing a quantity that could replace the lumen, that could be used to make calculations for applications where mesopic and scotopic vision are in use. And on a practical level, perhaps there is a need for a popular movement that would send HPS the way of mercury vapor. ■

**SPI**



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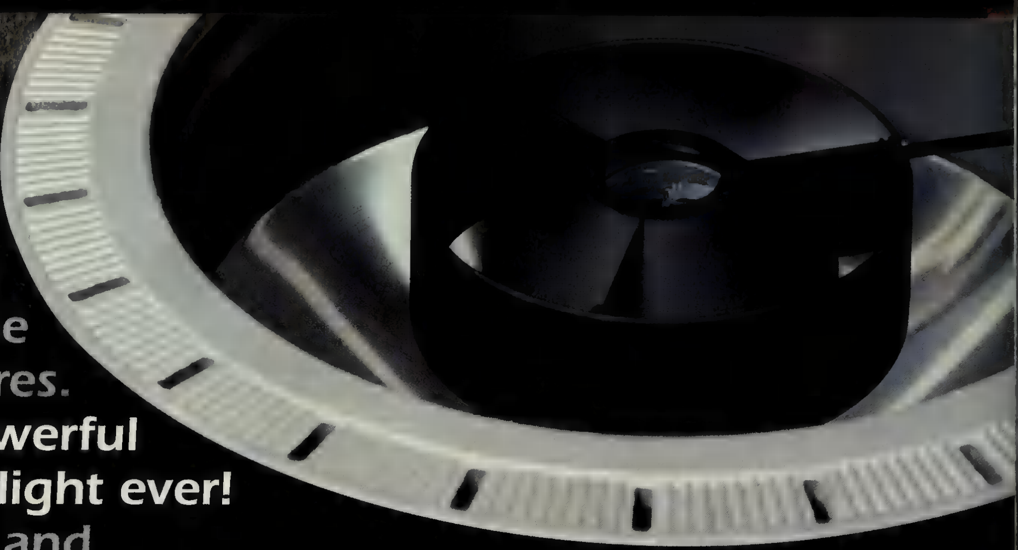

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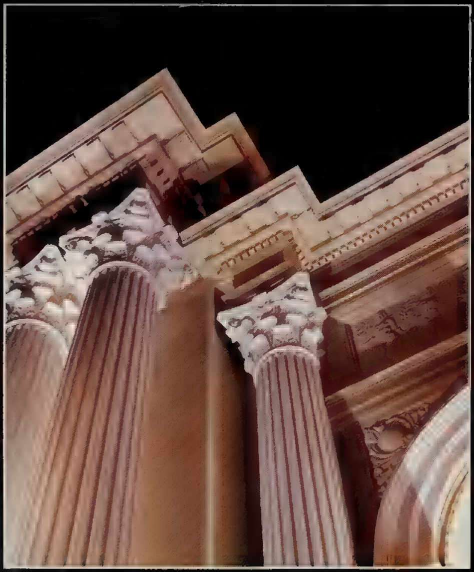

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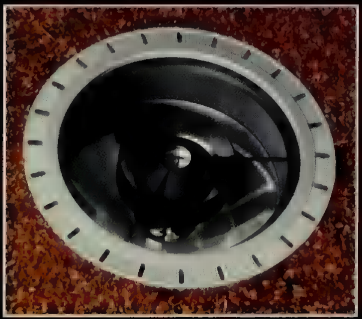

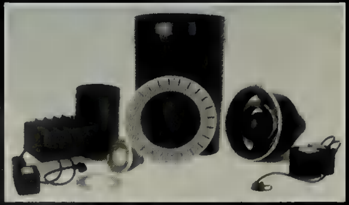

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# Halogen's New Challenger: Miniature Metal-Halide Lamps

by Lindsay Audin

If you can afford to, say goodbye to halogen and hello to Microsun, the newest lighting system on the block. Microsun Technologies' series of high-end table and floor lamps combines a pair of 15W incandescent bulbs with a new 68W metal-halide lamp that provides a blast of light: 6,000 lumens with a 3000K color temperature. The metal-halide lamp is powered by an electronic ballast. While significantly more expensive than halogen fixtures, these new luminaires should find a place in hotels, institutional settings, and upscale homes. If the cost can be lowered, the technology has the potential to expand to other markets.

### Taking the torch out of torchère

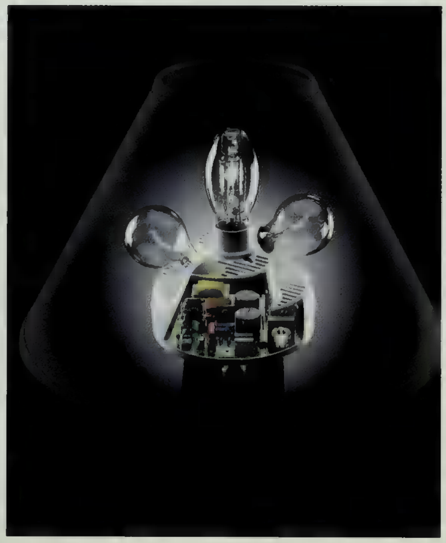
One example of Microsun's technology in use is Orbis, the Cleveland-based company's answer to the inexpensive halogen torchères that are extremely popular and extremely dangerous: considered fire hazards, they have been banned by many colleges and universities. Halogen torchères with a double-ended 300W T-lamp can be purchased for less than $30, so they're widely used in homes and dorm rooms. Such uplights are a cheap way to provide the indirect lighting that eliminates dark spots in a room as well as eye-tiring high-contrast lighting. But during operation, the surface temperature of a halogen bulb can approach 1,000°F, hot enough to ignite paper or fabrics on contact. Even if it has been covered by a wire frame or a glass shield, which people may discard when changing bulbs, a halogen lamp can easily start fires if knocked over—a lesson a lot of people learned the hard way. The Manhattan apartment of renowned xylophonist Lionel Hampton went up in smoke in 1997; he is suing the importer and retailer of the halogen fixture that caused the fire for $30 million. And it was a halogen lamp that started the 1992 fire in Windsor Castle.

The Microsun lamp assembly does a good job of replicating a halogen's high light output and good color rendering but uses only about a third of the wattage. What's more, the lamp doesn't need its own fire extinguisher—its glass bulb reaches only 250°F. When turned on, the incandescents provide instant low-level light and the metal-halide unit comes up to full output in 30 to 45 seconds. Measurements taken under identical conditions found that the 100W Orbis torchère provided 24.1 footcandles (fc), while a typical 300W halogen unit yielded 23.4 fc.

### A kinder, gentler light

A more subtle problem in areas with fine furnishings is the ultraviolet (UV) output of halogen lamps, which can be considerable. Sensitive fabrics (such as silks and even some synthetics), tapestries, and paintings can be seriously damaged by prolonged exposure to ultraviolet light, whether from halogens or from sunshine passing through nearby windows. While the UV levels put out by most sources of electric light are only a small fraction of those of direct sunlight, halogen fixtures tend to yield noticeable UV output if they are not covered by a special shield. While most lighting designers also consider metal-halide lamps to be major sources of UV rays, the Orbis exhibited a surprisingly low output. When bounced off a freshly painted white ceiling, the halogen's light yielded about 69 microwatts per lumen ($\mu$W/lm) of UV-A (typical for incandescent light), while Microsun's light showed only about 14 $\mu$W/lm. Neither source emitted any significant UV-B (which is generally more damaging to organic materials). Interior designers may find Microsun's lowered UV-A output valuable as a way to provide quality lighting while safeguarding furnishings or exhibits.

*Lindsay Audin is president of Energywiz Inc., an energy consulting firm, and lighting research consultant to E-Source, a Colorado-based energy consulting group.*



**Microsun uses a pair of 15W incandescent lamps to provide illumination during the 30 to 45 seconds the miniature metal-halide lamp needs to warm up. An electronic ballast powers the device.**

### Operating costs

Where lamps are operated for many hours—such as in institutional settings—the much higher energy efficiency of the Microsun system helps recoup the initial high price. Assuming operation for 4,000 hours per year (typical for public spaces), the differential cost between the halogen and metal-halide fixtures is paid off in about four years at the national average electric cost of $.08/kWh. Where power costs much more—in New England, California, and the mid-Atlantic states, for example—that payback period drops to less than three years. Metal halide also has a much longer life than halogen, reducing replacement and maintenance costs for an even better payback. The bottom line: the $200 to $300 investment for one of these fixtures is well worth it. ■

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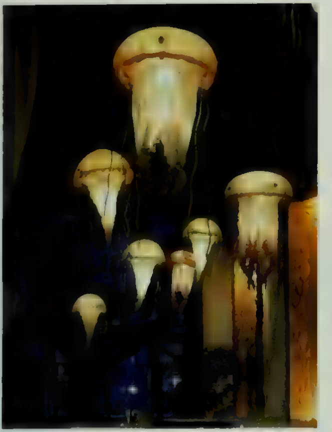
## LIGHTING BRIEFS



### ◄ Material effects

Sirmos's latest lighting project, for Pat Kuleto of San Francisco's Farallon restaurant, is a collection of retro-tinted jellyfish look-alike fixtures made of CyTron, a clear synthetic material that can be made to resemble marble, alabaster, onyx, or sandblasted or colored glass. All mold-making and modeling is done in house and CyTron, available in 13 ultraviolet stabilized colors and in matte, gloss, or semigloss finishes, can be inlaid with colors and shapes, etched, or sandblasted. 718/786-5920. Sirmos, Long Island City, N.Y. **CIRCLE 260**

### ► Folded arc

When artist Kevin Walz decided to use DuPont Corian as the diffuser for his arc wall sconce, part of Baldinger's Kevin Walz Collection, he challenged Corian colorists to create a custom color that would capture his vision. The result is an amber-colored sconce shown here in an antique brass finish that measures nine inches wide, four inches deep, and 11 inches high. 718/204-5700. Baldinger, Astoria, N.Y. **CIRCLE 261**

### ► A design legacy

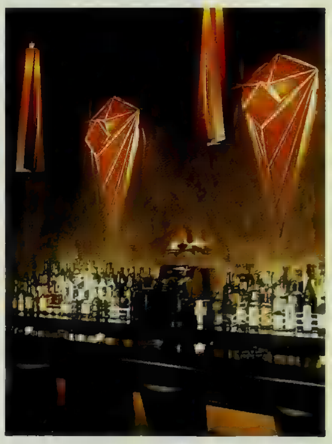
The latest lighting product to come out of the ongoing collaboration between the Yamagiwa Corporation and the Frank Lloyd Wright Foundation at Taliesin West is the Taliesin 1 floor lamp. Originally designed for the interior of Wright's own home, the lamp has been redesigned and reproportioned. It now stands 49 inches tall and is available in cherry with a natural stain and brass socket or in black ash with a black socket. 818/879-8611. Yamagiwa, Westlake Village, Calif. **CIRCLE 262**

### ▲ Whimsy shade

Helen Hiebert's 22-by-10-by-10-inch potted lamp plants a handmade-paper-flower shade with a copper stem in a terra-cotta pot. 718/369-3308. Helen Hiebert, Brooklyn, N.Y. **CIRCLE 263**

### ▼ A feast for the eyes

The maple-veneer sconces behind the bar at Torch, a New York City 1940s-style supper club, are three feet, six inches high and two feet in diameter at their widest point. 718/935-1809. Stewart Osborne Design, Brooklyn, N.Y. **CIRCLE 264**



### ▲ Swedge sconce

This polished chrome and satin nickel wall sconce with a linen shade is available from Powell and Bonnell, a Canadian furniture and lighting design firm. The sconce measures 16¼ inches high with a 5⅝-inch projection. 800/272-2058. Powell and Bonnell, Toronto, Ont. **CIRCLE 265**

### ▼ Vine chandelier

Lighting designer Robert Ferraroni, of Ferra Designs, collaborated with architect Adam Tihany to create this eight-foot-wide fixture for the New York City Greek restaurant Artos. The spiderlike hand-rolled steel arms are finished in black patina and coated with a satin lacquer. Each of the 14 incandescent fixtures is covered with a parchment shade. 718/852-8629. Ferra Designs, Brooklyn, N.Y. **CIRCLE 266**

### ▼ A big boy's bell

Italian manufacturer Antonangeli's Big Bell wall lamp, shown, measures 21½ by 25½ inches. Also available at Totem, the company's United States distributor, is a floor model or a lamp with cable or telescoping suspension. 212/925-5506. Totem, New York City. **CIRCLE 267**

*For more information, circle item numbers on Reader Service Card*

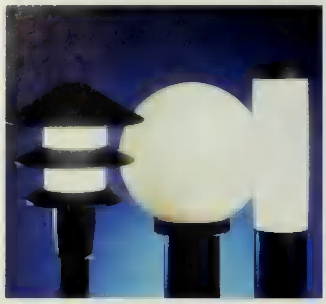
## LIGHTINGBRIEFS

### ▼ Compact lighting

Cooke's portable spotlight, called Megaray, illuminates objects beyond 3,000 feet and has three different beam settings: low, high, and strobe. The light source is a 125W short-arc Xenon lamp. Made from lightweight molded plastic, the Megaray comes with two IR filters and a power unit (which consists of a long-life battery pack and recharger). With the use of a switched-mode power supply, Megaray can be powered directly from light vehicles, trucks, or aircrafts. 716/833-8274. Cooke, Tonawanda, N.Y. **CIRCLE 268**

### ▼ Automated outdoor luminaire

Created specifically for outdoor architectural applications, the rotatable EC-1 from High End Systems has a completely sealed waterproof design and a six-position color wheel with replaceable dichroic filters. The fixture has a 575W source, a high-color temperature of 6200K, convection cooling (no fans are necessary) via an integrated heatsink/reflector combination, and a shutter for instant blackout and strobe effects. 512/836-2242. High End Systems, Austin, Tex. **CIRCLE 271**



### ▲ Garden of earthly delights

Alpan is a manufacturer of solar-powered garden lights, indoor lighting, and electronic home-security devices. The company's Monterey series—the Tier, Globe, and Pagoda—features energy-efficient 9W compact fluorescent lamps that are as bright as 35W incandescent bulbs but use less energy. They can also be equipped with a photo sensor and/or a timer. 805/383-8880. Alpan, Camarillo, Calif. **CIRCLE 269**

### ▼ Timeless beauty

The New England company Conant Custom Brass carries antique lighting and lamp glass. The UL-listed AS-1 classic sconce, just one example from a vast collection, is finished in a dark antique brass. 800/832-4482. Conant Custom Brass, Burlington, Vt. **CIRCLE 272**

### ► Directional projections

According to Lee Hedberg, an engineering manager at Targetti, the company's Mondial F1 system is a "modular space frame structure that incorporates precision directional projection." First designed in early 1997 by industrial designers Paolo Targetti and Piero Landini, and made from lacquered steel and a matte-aluminum finish, each module measures either 10 or 20 centimeters. Sixty- and 120-centimeter models are also available. The system is prewired and can be surface- or pendant-mounted (either horizontally or vertically) or suspended in clusters. Both open structural and closed versions are available. The Mondial F1 also incorporates a UL-listed module interconnect system (a wiring connection from one module to another). There are 30 interchangeable lenses that create various beam spreads. Application possibilities include restaurants, nightclubs, and museums. 714/708-8765. Targetti, Santa Ana, Calif. **CIRCLE 270**

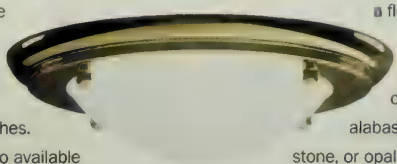
### ▲ Revolving range

The latest low-voltage fixture from Lighting Services is the adjustable 216 Series Orbiter, which uses a 75W MR lamp. The lightweight, specification-grade Orbiter module revolves around two separate axes for off-track striking angles. 800/999-9574. Lighting Services, Stony Point, N.Y. **CIRCLE 273**

### ▼ Flexible installation

Flex-Line is a low-voltage suspended track-rail system from Bruck Lighting U.S.A. Designed and engineered in Germany, Flex-Line has four flat copper strands connected to Makrolon, a UV-resistant transparent plastic, for either a curved or linear installation. The minimalist design uses remote transformers that supply power to two independent circuits, rated for 300W each. Other possible applications include tungsten halogen lamps, accent or task lighting, and wall-washing effects. 714/259-1000. Bruck Lighting U.S.A., Tustin, Calif. **CIRCLE 274**

### ► Ceiling edition



The AC2015, a semirecessed ceiling fixture from Advent Lighting that can be used with drywall or grid ceiling, is available in three sizes—all with shallow projections that vary from 2 to 4¾ inches. The fixture is also available with compact fluorescent options, including electronic ballasts, and with two to four 26W quads. Advent Lighting's collection of new products also includes an interior luminaire that handles up to a 400W metal-halide lamp and an ADA-compliant interior luminaire that is constructed with a shallow profile and a floating lens. The latter sconce includes an option for faux alabaster, hand-painted stone, or opal acrylic. A changeable ⅛-inch-thick bar stock gives the sconce durability. 800/739-9144. Advent Lighting, Greenville, Wis. **CIRCLE 275**

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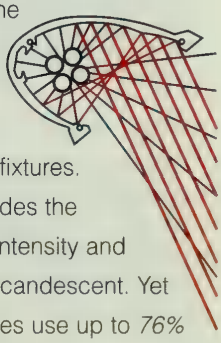


## LIGHTINGBRIEFS

### ▼ Security system

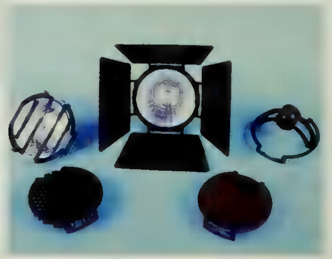
Ruud's square fixture, part of the SE series, is a security system for walkway, entrance, or perimeter lighting installations. The UL-listed series offers four optical systems in either 8- or 12-inch die-cast aluminum housings. Other features include a seven-year warranty (with DeltaGuard finish), heat-sunk electrical components, and vandal-resistant polycarbonate lenses. Available in wattages from 50 to 175. 414/886-1900. Ruud, Racine, Wis. **CIRCLE 276**

### ▲ Fiber-optic options

This exterior step lighting outside a Texas home uses quartz halogen and metal-halide lamp sources, which are contained in a black box called an illuminator at a remote location. Fiber-optic cable is then routed from the illuminator to the desired points of light (in this case, under the steps). Cable can be either end- or side-emitting, glass or plastic. In an application such as this, lamp maintenance is easily accessible. Since fiber-optic fittings are so small in scale, they allow for illumination precisely where it's needed. 210/227-7329. Lucifer Lighting, San Antonio, Tex. **CIRCLE 277**

### ▼ MR16 peripherals

The new lightweight, stainless-steel, easy clip-on attachments for American Lighting's standard MR16 lamp include barn doors, louvers, deco clips, and color filters. All of the durable attachments can be mixed and matched to change the direction, intensity, and/or color of the light. The deco clips and filters are available in blue, green, and red. The barn doors can be used in pairs for four-way control. The louvers can be used to help reduce glare and diffuse light. 303/363-6945. American Lighting, Aurora, Colo. **CIRCLE 278**

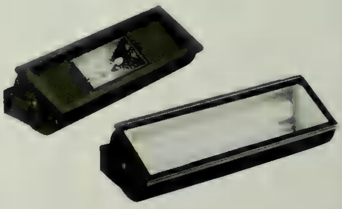


### ► Landscape lighting

The MG Series fixture from Phoenix is made of corrosion-resistant, copper-free aluminum—the same material that is used in the marine industry to protect against harsh outdoor conditions. The internal optic system is controlled by two exterior sets of screws that allow for 30-degree vertical and 360-degree horizontal aiming. The finish is powder-coated, and the base serves as the wiring compartment. 414/438-1200. Phoenix, Milwaukee, Wis. **CIRCLE 279**

### ▼ Electrodeless

Icetron, from Osram Sylvania, is an electrodeless fluorescent lamp system with a lamp life of 60,000 hours. Instead of an electrode at each end of the fluorescent tube, the Icetron lamp uses magnetic induction to generate light-producing electrons. 508/777-1900. Osram Sylvania, Danvers, Mass. **CIRCLE 280**

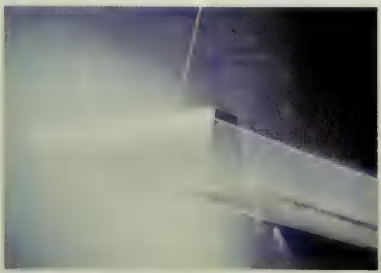


### ▲ Wet light location

The new aluminum housings for SPI's Echo series of lights, in lengths up to eight feet, provide structural integrity and corrosion resistance for most wet locations. Also new are weathered finishes for outdoor applications. Opticals up to 85 percent efficient accommodate linear, fluorescent, metal-halide, and halogen in single and multiple configurations. 414/242-1420. SPI, Mequon, Wis. **CIRCLE 281**

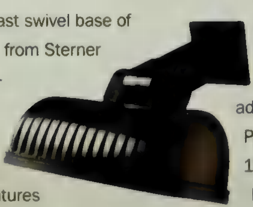
### ▼ Superthin supermodel

Known in the lighting industry as a leading manufacturer of linear lighting, Ledalite has a new product, called Crescendo, which has a compact, sleek design and aerodynamic form. The new T5 luminaire, part of the company's Ergoline series, measures a mere 2½ inches deep and takes standard T8 and biax lamps. It offers optical systems in indirect, semi-indirect (shown), and direct/indirect versions. Designed by the Canada-based lighting designer Galina Zbrizher, Crescendo is also available in 11- and 12⅝-inch widths. 800/665-LEDA. Ledalite, Langley, B.C. **CIRCLE 282**



### ► Precision

The heavy-duty, die-cast swivel base of the Infranor Polaris-6, from Sterner Lighting Systems, provides a number of aiming angles for very precise lighting possibilities. Other features include rectangular optics, a protective dual-seal gasket system, and a wiring compartment that is integrated into the swivel (eliminating the need for an additional junction box). The Polaris-6 operates lamps up to 175W. 800/328-7480. Sterner Lighting Systems, Eden Prairie, Minn. **CIRCLE 283**



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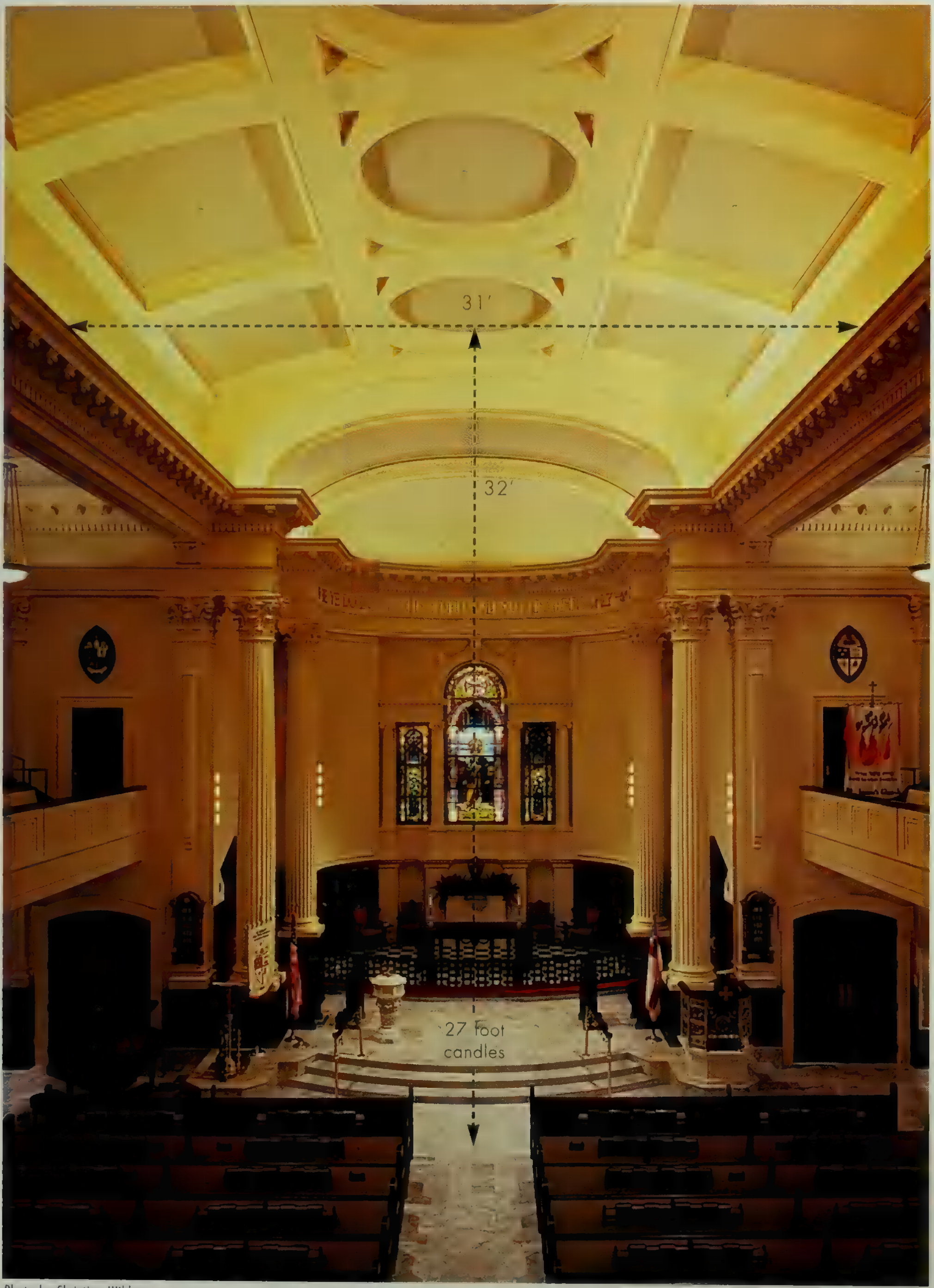
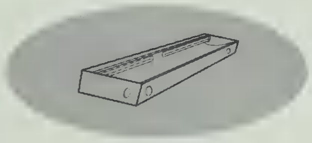
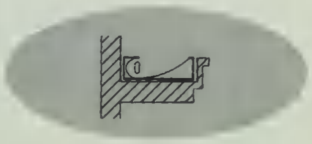


Photo by Christian Wildman





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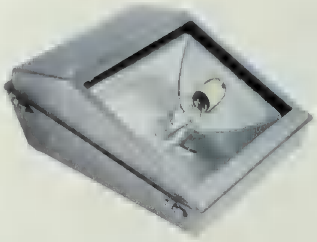
## LIGHTINGBRIEFS

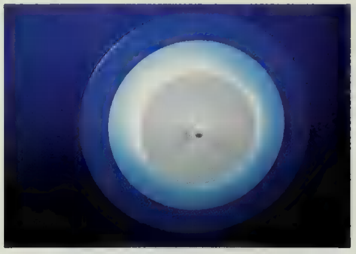
### ► Clean up light pollution



Commonly referred to as skyglow, light pollution can be caused by many factors, such as the poor aiming—or directional control—of light being emitted from a fixture's housings, or the artificial increase in ambient light surrounding roadway signage. Quality Lighting's SignMaster reflector system is made of hydroformed aluminum with a computer-enhanced reflector design for light uniformity. The system uses a thermal- and shock-resistant clear, tempered flat glass lens to further reduce light trespass and glare and eliminate skyglow. 847/451-0040. Quality Lighting, Franklin Park, Ill. **CIRCLE 284**

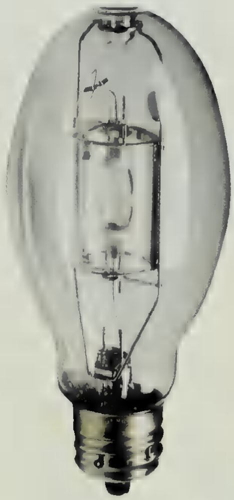
### ► Designer series

Luxo's Designer Series includes 24 different models of wall sconces and ceiling pendants. Based on Swedish designs, the fixtures are crafted in metal and acrylic forms reminiscent of the Machine Age. Plated or painted metal lamps, with clear or opal acrylic light diffusers, emit light from a range of low-wattage incandescent or compact fluorescent sources. Selected wall models meet ADA requirements for maximum projection from the wall. 914/937-4433. Luxo, Port Chester, N.Y. **CIRCLE 286**



### ▼ Energy-saving watt system

The Uni-Form Pulse Start 200W system (lamp and ballasts) can replace a 250W metal-halide lamp and ballast combinations. It offers energy savings of 63W per fixture (-21 percent); identical initial lamp output (21,000 lumens); 50 percent longer lamp life (15,000 hours); and longer periods between maintenance. 800/437-0111. Venture Lighting, Solon, Ohio. **CIRCLE 285**



### ▲ Hanging around

Designed to supply both up- and downlighting, Holophane's CentaGlo has a borosilicate prismatic glass reflector and refractor. The uplight skims the overhead to reduce the contrast between the ceiling and the fixture; the downlight provides vertical illumination for improved visuals. The CentaGlo offers energy-efficient HID ballasts and lamps. Holophane, Newark, Ohio. **CIRCLE 287**

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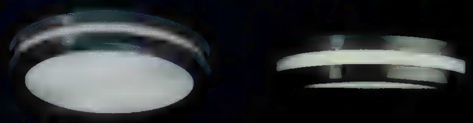
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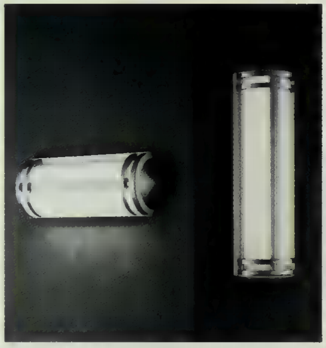
## LIGHTINGBRIEFS

### ▲ Jungle fever

The Hanible lamp from Brunschwig & Fils (#A0149-MMM) is made of hand-painted carved wood. The dimensions of the floor lamp are 13 by 16 by 16 inches; the tabletop is 22½ inches high. The shade is made of an 18-inch-wide natural paper. 212/838-7878. Brunschwig & Fils, New York City. **CIRCLE 288**

### ▸ Two to tango

Designed by the Spanish firm Marset in Barcelona and distributed exclusively in the United States by Tango Lighting, the Bau industrial-style cast-aluminum framed pendants are part of a contemporary collection of wall, ceiling, and portable fixtures. The Bau is available with either a metal (painted gray or white) or translucent acrylic shade, and in 9- or 12-inch diameter. It takes an incandescent lamps of 100W maximum. 201/662-7012. Tango, North Bergen, N.J. **CIRCLE 289**

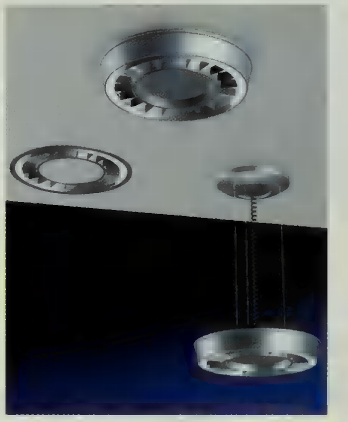


### ◂ Choice mount

The Avatar fixture from Visa Lighting has die-cast end caps with solid brass or aluminum decorative domes; extruded aluminum housing and mounting plates; a removable housing for cleaning; and white acrylic or clear prismatic lenses. Available as a wall or ceiling mount, with both vertical and horizontal capabilities. The lights are both UL and CUL recognized. 414/354-6600. Visa Lighting, Milwaukee. **CIRCLE 290**

### ▾ Dutch design

Developed by WILA and the Dutch design firm n/p/k, the E Control compact luminaire is available as a recessed, surface-mounted, or pendant fixture for use with 22, 40, 54, or 60W lamps. The circular fluorescent lamp TR16 is also equipped with prism covers, opal screens, or glare-free louvers for lighting workstations. 401/435-5800. WILA, East Providence, R.I. **CIRCLE 291**



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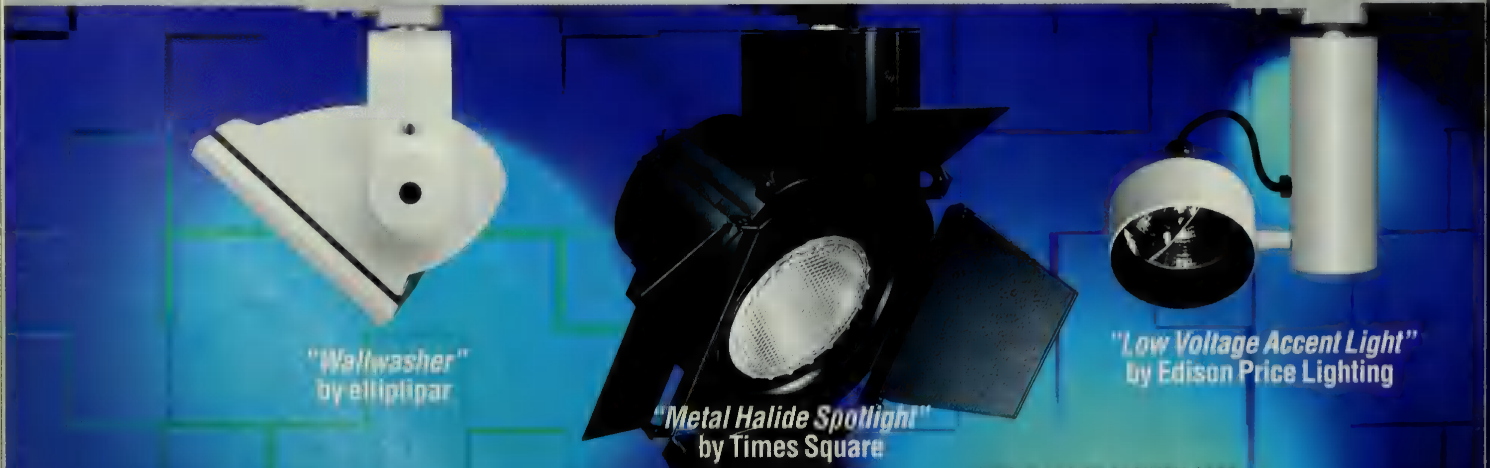

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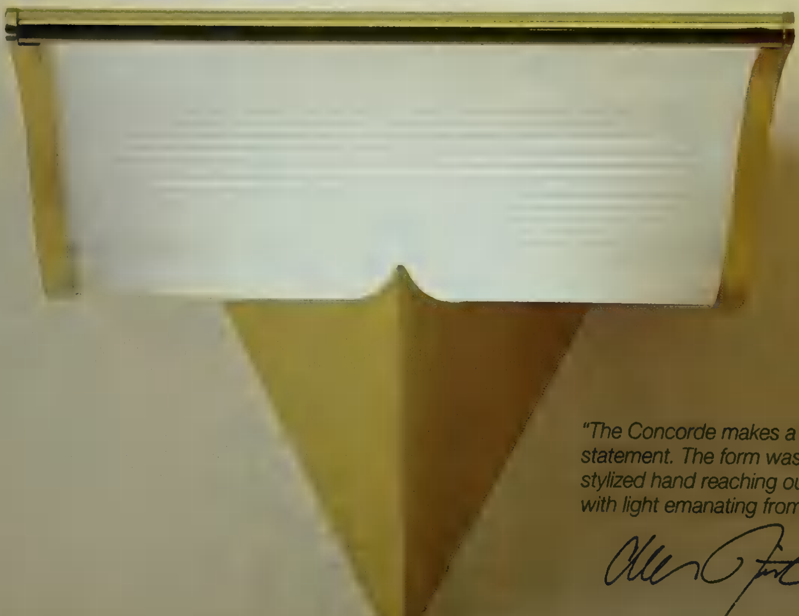

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## LIGHTINGBRIEFS

### ▼ Pole-mounted fixture

The inverted tapered pole of the Amalfi fixture is made of corrosion-resistant steel. The luminaire is anodized aluminum with a domed, temperature-resistant borosilicate glass lens that will not discolor with time or use. The trim is finished in a textured-matte, silver/gray metallic color. Also available as metal-halide or halogen lamps. 704/471-2211. Hessamerica, Shelby, N.C. **CIRCLE 292**

### ▲ Don't forget to use Flos

The Bloc lamp, designed by Rodolfo Dordoni, has a varnished-metal frame and a diffuser made of polycarbonate meshwork. It is available in amber, white, blue, or green. In order to be visible in the dark, Bloc is equipped with a rod-operated switch varnished with a fluorescent material. The light is available as either a wall-mounted or a pendant fixture. 516/549-2745. Flos, Huntington Station, N.Y. **CIRCLE 293**

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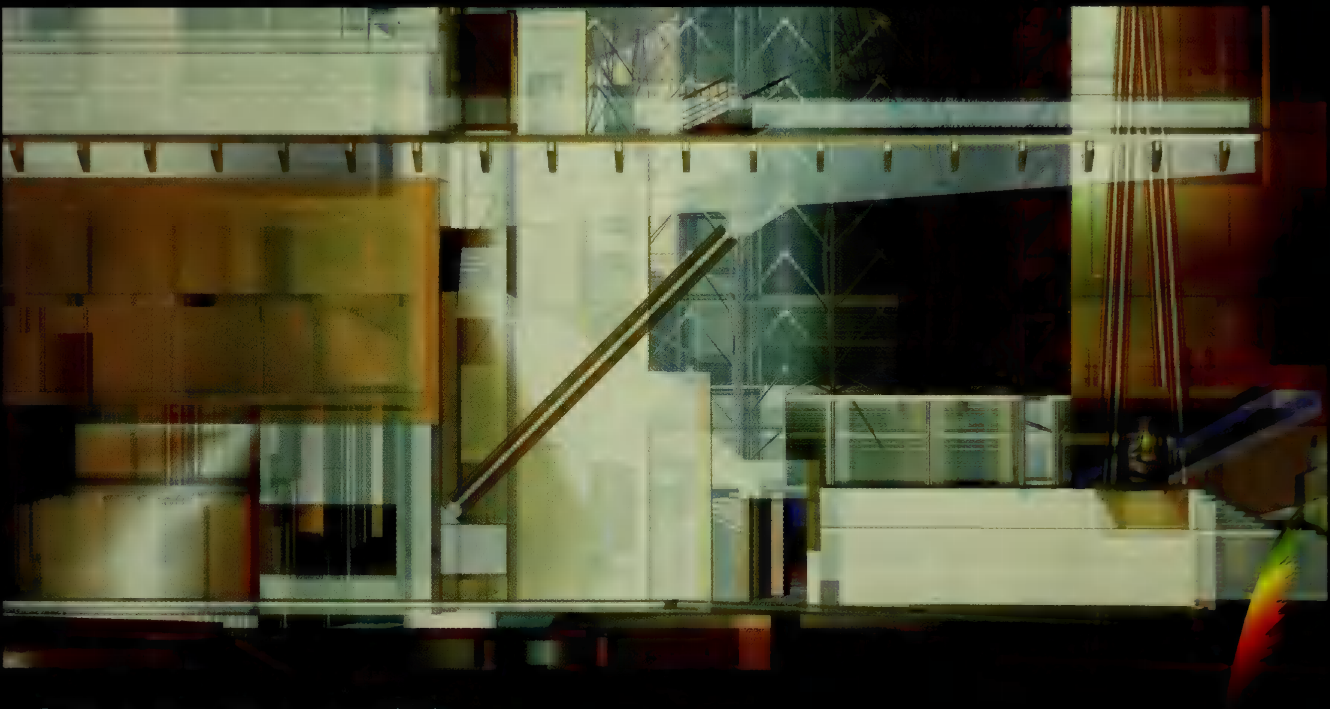

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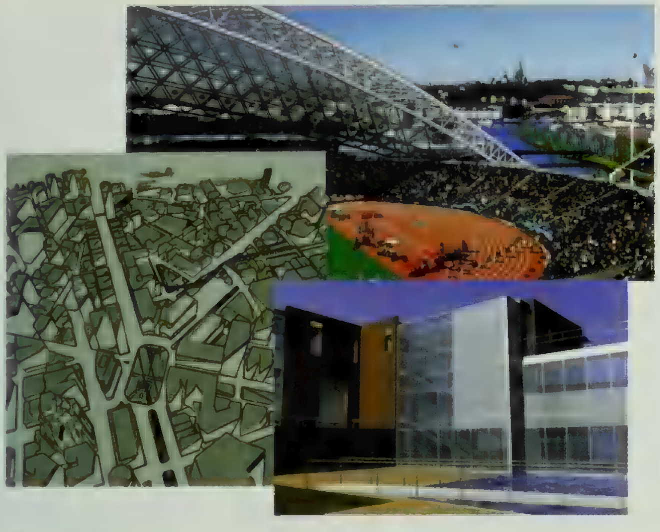

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*New Orleans transforms a historical French Quarter landmark into a multi-purpose arena.*

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# Time, Trust and Architecture

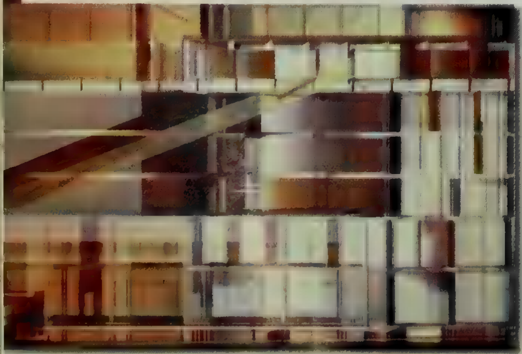
by David Marlatt, AIA

While almost any architect would recognize that forces of technology are sweeping vast change across society and the business world, very few consider the long-range effects of these forces on the practice of architecture or on architectural form. For example, the prospect of the World Wide Web as a primary media connecting businesses and individuals — a direction in which society is currently heading — specifically challenges two important assumptions that architects have accepted for generations, if not centuries.

The first of these assumptions is that architects, occupants and clients share more or less the same concept of **time** and that great architecture is generally designed, built and *appreciated* slowly. The second assumption is that great architecture requires a strong relationship between architect and client that is built upon **trust**. Now, we are not claiming by any means that the Web signals the end of Time and Trust, but it is marking important shifts in their character that will profoundly effect architectural form and practice. We believe that these shifts have started already and that architects should be paying attention.

## TIME

It is cliché to speak about the "compression of time" or the steady quickening of life's pace. But at the time scale of architecture, this phenomenon assumes special meaning. This is not the same issue as mobility, which has literally been with us since Moses. This is about new conceptions of what is permanent and what is temporal. It's about people taking "real time" very seriously and considering gratification the highest form of spiritual fulfillment.



Traditionally, great architecture has required great sums of time to be appreciated. If a society no longer respects great spans of time, however, can it value architecture that can only be understood in that context? Does it grow impatient and build theme parks around that which was intended to be static and contemplative?

Stepping back for a moment, strategies have been developed in the past which address problems of time within the realm of architectural form. Four representative strategies are:

1. tents and other tensile structures that address mobility;
2. panelization and pre-manufacturing, which move architecture closer to a commodity (did Vitruvious foresee panelization when he wrote of firmness, commodity and delight?) and shorten the building's time to market;
3. "market driven" design for an anonymous client type (think of home plan services) to "mass produce" the design process and shorten the time to begin construction;
4. separation of a building frame or shell from its contents (such as in the case of shopping malls or the work of Herman Hertzberger), which addresses mobility by occupants while relegating "architecture" to the more permanent container.

The above strategies, however, only address the imperatives of speed and efficiency. None of them seriously question whether the best architecture should be "timeless" (meaning in this sense that it will endure and be appreciated across many ages). Are our architectural values inextricably interwoven with a fixed concept of time or can the two be separated?

The impact of new notions of time on form certainly deserves to be the subject of future study. Also worth exploring is the complex relationship of time and architectural practice, which is where this article will turn its attention.

### *So Much To Do, So Little Time*

The classic response to a complex problem is to automate. When time is perceived as the problem, the first response is to "go faster" by automating drafting, by fast tracking, and by cutting steps through Design/Build. Like trying to squeeze extra modem speed from old phone lines, however, automating an old process to address a new reality is ultimately a losing proposition.

The problem with current architectural practice is not that it is too slow, but that the right building information is not where it needs to be at the right time. To get that information to the right place at the right time, one or more pieces of information — or entire projects — usually have to be resolved or get out of the way first. Offices that are accustomed to sketching on paper, building models, then drafting aren't leveraging the information in the 3D model for detailing and communication. The solution does not lie in automating the traditional practice to make it go faster, but in simulating the building process to make more building information available simultaneously.

Automation characterized the Industrial Age. Simulation is the key to problem-solving in the Information Age. Think of the World Wide Web as a very sophisticated simulated world with virtual stores, governments, universities and private citizens. It effectively addresses the problem of access to informa-

tion in a complex society, not through speed (and this is quite an understatement), but by offering replicas of libraries, stores and other institutions without physical travel, business hours or human contact. One can lament the loss of human interaction but hardly deny the benefits of having access to knowledge from around the world at any hour of the day thanks to simulation.

Similarly, the virtual building does not save time and money through acceleration of old design and drafting processes, but through simulating the building process and making all known building information available to everyone on the team simultaneously and immediately.

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DIMENSIONS

Here is an example of the limits of automation confronting the benefits of simulation. Graphisoft prides itself that ArchiCAD is "always" in 3D. In other words, just drawing a wall in a plan view generates a three-dimensional wall even if you don't look at it. Almost invariably architects find ArchiCAD's 3D functionality useful and powerful even as a production tool, but sometimes they tell us that they don't use 3D much because their "clients won't pay for it."

Even with ArchiCAD, consistently producing good 3D models of a building carries some initial cost such as additional upfront time for the user to design, compute time for renderings, and perhaps extra RAM or paper for the color printer.

But the benefits of this investment can be overwhelming for both architect and client. They include avoiding construction errors, improved communication among all team members, improved design and client satisfaction. Furthermore, the client has materials he or she can use to begin marketing the building while the architect can continue offering visualization services of the virtual building. As visualization becomes more of a consumer and government expectation, investing time in 3D modeling should become even more compelling.

So, why aren't clients demanding that their architects "do 3D?" Why are not architects with the capability to create 3D models just doing it anyway so they can save money later in the project?

Part of the problem is communicating the benefits to the client and internally; and to some extent project planning. A deeper problem lies in the natural limitation of accelerating an old business model based on separate design and drafting rather than adopting a new one based on building simulation.

The architect's classic fee structure rewards drafting as the ultimate activity in a linear process so documenting the building doesn't receive adequate attention early even though the integrated model already contains most of the necessary information. Project managers often don't realize that they can start working drawings simultaneously with the schematic design and save time on the back half of a project. Through simulation, all aspects of a project can advance together and a wide variety of information (material lists, details, floor areas, pictures, VR scenes, etc.) is accessible at any time to other team members without interrupting the overall progress.

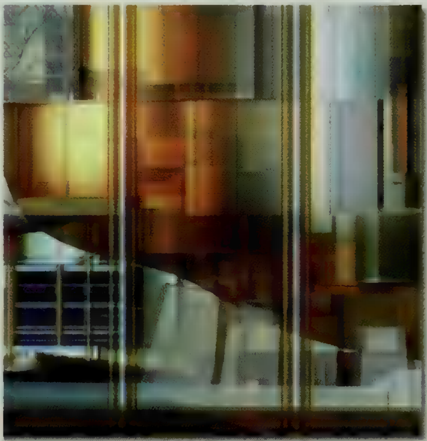
### *Architectural Process Management is Three-Dimensional and Simultaneous*

If architects would begin simultaneously developing and managing all of the information about a building instead of taking an assembly line approach to design, practices would probably operate more like servers of building databases, with limited access for clients, consultants, building officials, and others. The architect would be responsible for the building intelligence contained in the virtual building, but not necessarily for generating field drawings needed by a particular discipline. Software would control access, maintain security and accountability, and answer queries about the building. The role of the architect as creator would be stronger than ever, but documenting the building would evolve from drafting and specifying to developing and managing the building's knowledge base over its lifecycle. Rather than draw the location of a standpipe, the knowledge base would indicate where to find it, identify experts who can tell you more about fire prevention in the building, and identify all related information as well.

## TRUST

If one tenet of successful architecture is time, the other is trust. Another cliché: there is no great architecture without great clients. This means great architecture requires a strong singular relationship between architect and client founded in a qualified trust that endures at least as long as the project.

Trust is the foundation of all commerce. Companies know that they cannot persuade you to give them your money (more than once) unless you trust them to return something of comparable value. Trust requires predictability and persistent identity. High trust consistently translates into high value (Nordstroms department store knows this well). The inability to establish trust usually translates into discount pricing and eventually lower quality goods or services. CAD developers know this, too. The high value vendors try to establish trust through security, service, and building a professional rapport. CAD software bought through catalogs need not (or cannot?) do the same.



Architects know intuitively how important personal trust is to their practice and value. AIA member firms also report that repeat business is responsible for 86 percent of their business. If traditional assumptions about trust change, upon what will architects base their own value and relevance in the future?

The nature of trust is clearly changing and the symptoms are all around us in architecture. Not only in the latest "tougher than usual" fee negotiation, but in the fact that the largest nine percent of U.S. firms now control more than 61 percent of all architectural billings, one in six AIA firms employ an exclusive marketing staff to find work, and 40 percent of all billings can now be attributed to services expanded beyond traditional practice. Architects say that the economy is more competitive, but there is more wealth than ever before. The competition they sense is in establishing and defending their value to an increasingly distrustful and sophisticated client.

Once again, the problem and the solution are both in the technology. Some very large and sophisticated companies are struggling with the problem of how to build trust on the Internet. Why? They want to sell their products and only a few companies so far have made much money doing it. For Web commerce to grow at the exponential rates being predicted, sellers must establish trust with buyers.

However great and powerful the Web is for other things, personal trust cannot occur there. A human experience such as trust can only be simulated in the electronic world of the Web.

As a result, consciously or not, successful companies on the Web are simulating trust through three important strategies: "Customer Service," "Branding" and "Self Service." Architects should understand these strategies and think about potential corollaries in their practices.

### *Customer Service and Diversity*

Customer service has become a buzzword and a key selling point in many industries in the past few years. It's not just a fad. Being friendly and responsive, even if it is an automated response, is the most obvious way to replace a face-to-face relationship with a customer. Through increased customer service, companies spend more time with a customer, which increases the chances that the customer will make other purchases; they win deeper customer loyalty; and they add value to their product or service.

Money back guarantees are also a form of customer service for manufacturers. The nature of professional services tends to a make the idea of a money back guarantee moot. One U.S. firm, however, has already successfully experimented with occupant-satisfaction based fees. Fees based in part on a measurement of a building's performance are probably not far away.

Architectural firms are generally already 100 percent customer service and deeply focused on a small number of clients. For them, the challenge is not to go deeper in a personal relationship, but to accept that a client relationship during the traditional design phase cannot be as intense or long-lasting as it used to be. These firms substitute breadth for depth to hold their traditional value.

The latest AIA firm survey indicates that more firms in the United States are diversifying their services. Many services such as visualization, analysis, planning and programming are by-products of the stores of building data amassed through their CAD systems. Other services such as interior design are simply leveraging the same building data to offer a more complete set of services. In both cases, a well-developed virtual building is the basis for extended client services.

### *Branding and Reputation*

Branding is a buzzword for what most architects simply call building a reputation. Large companies employ branding strategies to build a reputation for their products before the buyer may have had any direct experience with them.

Many common branding techniques are already used by large architecural firms with marketing departments. For example, establishing a firm's credentials through statistics ("according to X, we're the largest, oldest, employ the most architects, etc."), building comfort through market share ("we're #1 in prison facilities in the Midwest"), and prestige through professional awards and publications.

Technology has also become part of branding, although it is no longer so impressive to brag about how much of it you have. Rather, the emphasis is now on how well a firm understands and leverages its technology.

Employing CAD software for more than just drafting is one example of this as are developing a job Intranet site and publishing construction documents on CD-ROM. Since many clients have experienced the benefits of technology in their own businesses, a firm can build its own reputation on the idea that its technology is to be trusted.

Company websites are probably already too common to build brand by themselves, but some firms are using them to offer "virtual tours" of their projects, demonstrating both their assimilation of technology and their architectural design skill.

### *Self Service and Client Service*

The idea of self-service to build a product brand is one of the sweetest ironies of the Information Age. It is drawn from the simple idea that, in a virtual world, the only "real" person available to trust is yourself. Companies such as Dell Computer, Amazon.com and FedEx say in effect, "we know you can't trust us, so we trust you to help yourself." Through a friendly interface and a few helpful hints (customer service!), the company trusts you with their technology to browse for a book, build your own computer, and track your own package.

Because of the Web and other economic reasons, we are building a society where self-service has assumed a different connotation than 20 to 30 years ago. Within the architectural profession, this translates into opening the black box of design and inviting the client to participate more in the architectural process, potentially even working side-by-side with the architect as a 3D model is developed. It also means giving clients direct access to browse information about his or her building, perform analyses and generate reports. There are risks involved, but the rewards can be great as well. For a self-service model to be feasible in architecture, information needs to be as comprehensive and immediate as possible because a question related to area, specification, cost or aesthetic can come from any direction and must be answered with the same authority. For many architects, this will cause a huge shock, but their practices will eventually depend on helping their clients to help themselves.

## ARCHITECTURE

Two years ago we predicted trends that will change billing structures and scope of services. Many of these changes were the result of technology, others the result of economic forces. Today, more architects than ever have joined their own clients by embracing the available technology to improve their practice. Nevertheless, it is still astounding how many have not employed technology at a meaningful level. The reasons are financial, technological, generational and cultural.

Two years ago, architects by and large were at the threshold of the Information Age. Today, they are inside and facing their greatest challenges and greatest opportunities. Almost all of the attention paid to the Information Age has focused on technology, but technology such as CAD, the Web, email and computer processors is avoidable. The change that they induce is not. Technology is a tool set to build what we will in the midst of change.

To paraphrase an old adage: When all you are is an architect, every problem tends to look like a building. When you are an architect in the Information Age, however, your problems may look like opportunities to broaden your influence in the building process, extend your reach into the 3D world, and develop a more durable and profitable architectural business.

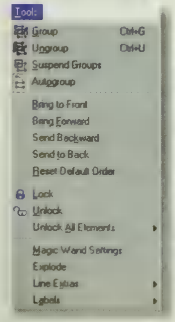
# ArchiCAD® 6.0

Built on the solid foundation of integrated virtual building, ArchiCAD 6.0 offers new features and enhancements that benefit every facet of architectural practice. Long-time users of ArchiCAD will see in version 6.0 the fruition of themes initiated with ArchiCAD 5.0: the ability to customize and add functions, communicate with databases, and work in multiple views. This latest version also delivers innovations that accelerate 2D production and 3D modeling. And, as with all major ArchiCAD upgrades, users from around the world will recognize Graphisoft's responsiveness to their input and suggestions.

We've classified the hundreds of new and enhanced features into the 6.0 categories below and presented the highlights of each. Here's a guide to what's inside the latest version of ArchiCAD:

## Get the Drawings Out the Door Faster

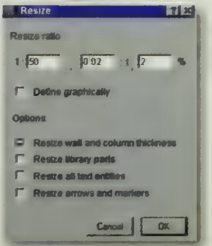
Ten's of thousands of architects depend on ArchiCAD every day to produce complete and professional working drawings, and ArchiCAD 6.0 delivers a variety of intelligent and sophisticated tools to make "getting the drawings out the door" easier than ever before.



New options include a rotatable grid, a "repeat last" command, and a powerful "send to back/bring to front" feature that controls the order in which drawing elements are displayed. Lines and 3D elements can be offset. ArchiCAD's intelligent cursor is even smarter with more snapping options. A new ellipse tool completes ArchiCAD's palette of 2D shapes.

ArchiCAD 6.0 can also resize a selection of elements with intelligent options to preserve text, markers and objects.

ArchiCAD's Multiply command goes to new extremes with the ability to distribute an entire matrix of new elements on screen. Each construction element line type is now editable, offering users complete control over their drawings. Similar to ArchiCAD's powerful Line Type Editor, custom fill patterns can be created quickly.



Resize ratio
1 : 50 , 0.02 : 1 , 2 %

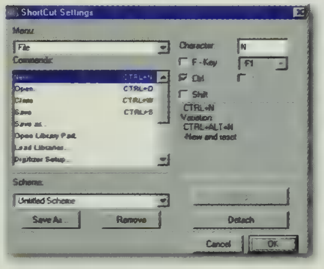
☐ Define graphically

Options

● Resize wall and column thickness
☐ Resize library parts
☐ Resize all text entities
☐ Resize arrows and markers

For easy detailing, new "Patches" can be glued to wall intersections, building sections and wherever details are needed. Because patches are ArchiCAD objects, they can be stored in libraries, made parametric, included in quantity calculations and appear differently according to drawing scale.

While it retains its familiar organization, users will immediately notice that ArchiCAD sports a new look and several tools have been consolidated into logical groups to further simplify its workspace. Drag & Drop technology is implemented throughout ArchiCAD 6.0 so objects can be pulled directly into a project from the Explorer or Finder, and clipping files can be sent to any Drag & Drop enabled application.



Menu: File

Character: N

☐ F-Key F1

☑ Ctrl

☐ Shift

CTRL+N
Variation:
CTRL+ALT+N
New and reset

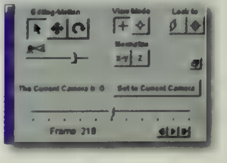
Scheme: Untitled Scheme

Power users can create custom keyboard shortcuts for all menu items, while a new Pet Palette containing frequently used tools follows the cursor and allows command changes on the fly. An enhanced QuickViews palette provides instant access to plans, stories, layers, sections, elevations, scale and display options. Group/Ungroup/Autogroup, introduced with ArchiCAD for TeamWork, keeps logical element sets together for easy editing.

## Keep Your Work in Perspective

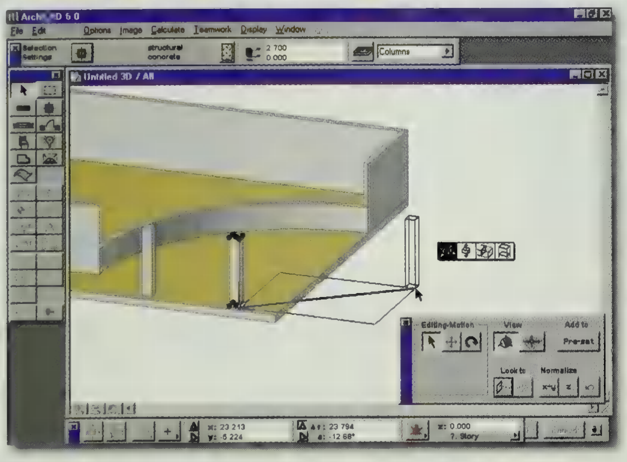
In 1982, Graphisoft was the first company to offer 3D modeling on a desktop computer. In 1998, with the availability of more powerful computers and a new generation of architects, ArchiCAD 6.0 breaks new ground again with an intuitive and integrated interface for working directly in any 3D view.

With ArchiCAD, working in 3D is easy and can be done in shaded, hidden line and wireframe modes. The 3D view can be rotated on screen without having to reset cameras or views. Or, simply click on a wall, roof or other surface to turn the view perpendicular to a work surface. Fast "ghosting techniques" provide a real-time preview of each element as it moves, keeping you oriented and in control even in very complex spaces. Thanks to the virtual building, changes in



# Packs Features for All Facets of Architecture

oriented and in control even in very complex spaces. Thanks to the virtual building, changes in the 3D view update the 2D drawings and vice versa.

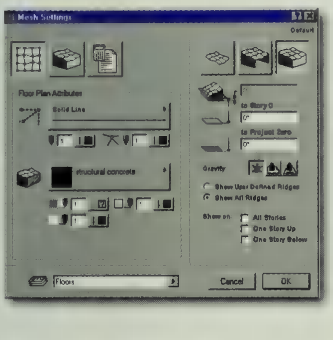


### Build Better Architecture

A new Surface Mesh tool constructs site models and irregular forms, and a Magic Wand tool creates new building elements with a single click on any shape.

The new ArchiCAD supports non-parallel and irregular vertical walls. Walls and objects such as doors and windows can be trimmed to complex roof shapes. Composite roofs automatically heal into walls and floor systems.

A time-saving concept called "gravity," automatically places walls, columns or other elements on the slab, roof or ground plane below them, eliminating the need to search for the Z coordinate. While the Gravity feature is on, a new Coordinates Bar displays the height of any point on a roof or floor system as the cursor passes over it.



ArchiCAD 6.0 can also join, divide and intersect any polygon, fill, zone, roof or slab element using Boolean operations.

### Connect with the Data

Architects will immediately benefit from ArchiCAD's re-written properties database by generating customizable door and window schedules on demand (and hotlinking them to PlotMaker drawings). This feature, however, represents only a fraction of ArchiCAD's awesome power to filter and customize any building data and to work dynamically with external building product databases, whether on your own computer or across an Intranet.

Additional power and control appear in the new Properties Object, which stores details such as manufacturer, price, schedule symbol and other properties. These new objects provide a practical way to turn generic objects into manufacturer-specific ones. A single building components database also simplifies defining, tracking and maintaining all of the building elements. The database can be as basic as a list or as sophisticated as a relational database on a remote server, and it can be used across multiple projects.

### Customize Your Workplace

Certainly one of the most significant changes in the new ArchiCAD is its complete and robust set of links for customization, called an Application Programming Interface (API). Although the average user will not begin immediately writing new software to run on top of ArchiCAD, he will benefit from the dozens of custom applications available now or in the near future that perform a variety of functions such as complex shadow studies, framing calculations and smart file translation.

ArchiCAD's GDL environment has also been improved with new GDL entities as well as scripting tools to help users create objects more efficiently than ever.

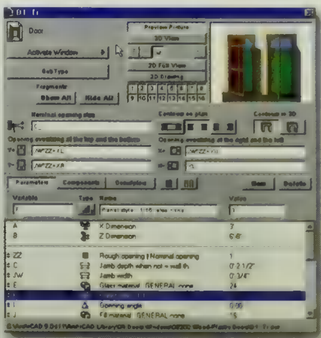
### Collaborate In and Out of the Office

In 1997, ArchiCAD for TeamWork introduced an entirely new method for architects to collaborate by sharing the 3D building model (and winning the Software Publishers Association's coveted Codie Award for Best Groupware Product along the way).

ArchiCAD 6.0 enhances the TeamWork functionality introduced last year and, thanks to its new API, delivers a richer set of data exchange formats. For example, ArchiCAD for TeamWork users can now change their workspaces on the fly.

Using the new API technology, ArchiCAD 6.0 offers an enhanced DWG 14 file translation that preserves ArchiCAD's wall structure and recognizes model and paper space within PlotMaker. And, thanks to ArchiCAD's Grouping technology, ArchiCAD can preserve Xrefs when DWG files are imported and exported. A DGN translator based on API technology is also planned for ArchiCAD 6.0.

With all of its changes and enhancements, anyone would expect that a more powerful computer is needed. Version 6.0 offers good news again as RAM requirements remain the same as previous versions of ArchiCAD, and its new 3D data structure can actually reduce files sizes by up to 50 percent.



ArchiCAD 6.0 truly delivers to architects the dedicated tools and technologies they need to make better architecture, deliver construction documents efficiently, and build their practices through additional client services around the virtual building.

# Graphisoft Sparks High Tech on Danube

Graphisoft R&D Rt. – Budapest, Hungary

Some companies might balk at the prospect of practicing what they preach, but when Graphisoft R&D had the opportunity to test its concepts of creating and managing the "virtual building" on its own new corporate headquarters, it jumped at the chance. "There was really no question about it," said Graphisoft COO Péter Hornung, who manages the entire project. "We were convinced that the effort to develop and maintain a 3D model of our buildings would offer immediate payback, and it has."

The company was rapidly outgrowing its facilities in Budapest and needed to find a long-term solution to house its R&D staff, and worldwide sales, marketing and administrative employees. Today, Graphisoft employs more than 140 people in Budapest spread out over five small buildings east of downtown. Rather than just find a larger building, the company decided to purchase a seven hectare (18 acre) tract of land along the Danube River just north of central Budapest and develop Graphisoft Park, Hungary's first high technology office park. "Some people call it the Danube Silicon Valley," said company founder Gábor Bojár. "Our concept behind Graphisoft Park is to nurture the region's software development business and help it become a real industry."

Three of the 15 buildings are under construction now. Graphisoft will occupy the largest building, at 3000 square meters (32,000 square feet). The other two buildings have already found software developer tenants including the Hungarian office of Microsoft. Formerly owned by the state's gas utility, the site required some environmental cleanup. A decision was made to cover only 15 percent of the area with buildings. The result is a low-density campus with drives made of interlocking pavers, tree-lined footpaths along the Danube and large landscaped areas. "Graphisoft Park offers our close strategic partners and independent ArchiCAD-partner-product developers a relaxed working environment," Bojár explained.

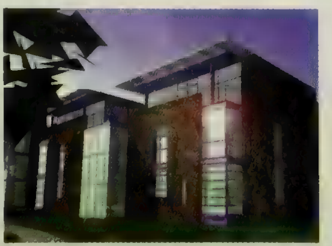
Six local architectural firms were invited to compete for the commission to design Graphisoft Park. Winning architects Ferenc Cságoly and Ferenc Keller from Építész Stúdió Kft (Architects Studio Ltd.), immediately put ArchiCAD to use creating a rich vocabulary of brick, glass and steel that recalls the site's industrial heritage of the last century, but is clearly looking forward to the next. Cságoly and Keller divided the Graphisoft building into two parts and kept them to only three stories to reduce the building's mass and segregate R&D from other company functions. Small floor plates ensure everyone is afforded views of the Danube or surrounding trees.

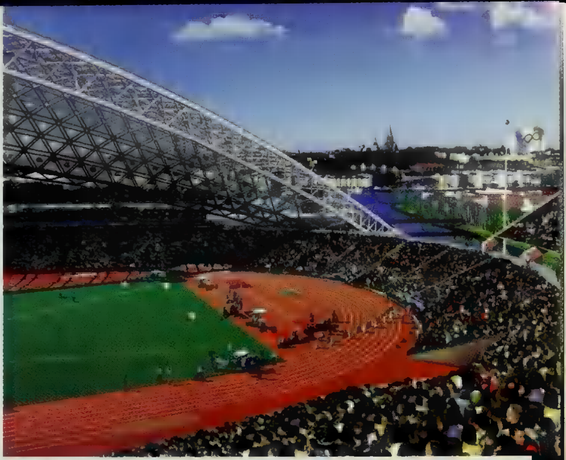
"We insisted on developing and maintaining a complete 3D model from the very beginning," Hornung reported. "The entire company was caught up in the design process and ArchiCAD's visualization tools were invaluable to getting people involved. We posted renderings and VRs to our company Intranet site so everyone could see their new space, and now we are posting the buildings under construction. From an operations point of view, I think this will have a huge benefit by making the transition from the old to the new space as smooth as possible. I also have to stress how important the 3D model was to quickly leasing all of the space."

> "The entire company was caught up in the design process and ArchiCAD's visualization tools were invaluable to getting people involved."

Since the architect's "virtual building" contains almost all of the information used for construction, it will be maintained and updated later for continuing facilities management and leasing. "We're looking forward to this next phase of using ArchiCAD. I think playing the role of client helps us to better understand and respond to our users," Hornung said.

The Graphisoft building will be completed in June 1998, followed in the summer by two additional buildings.



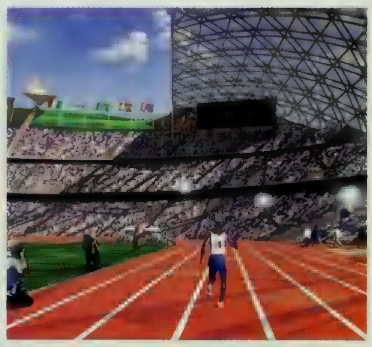


# Stockholm Plans Olympic Stadium

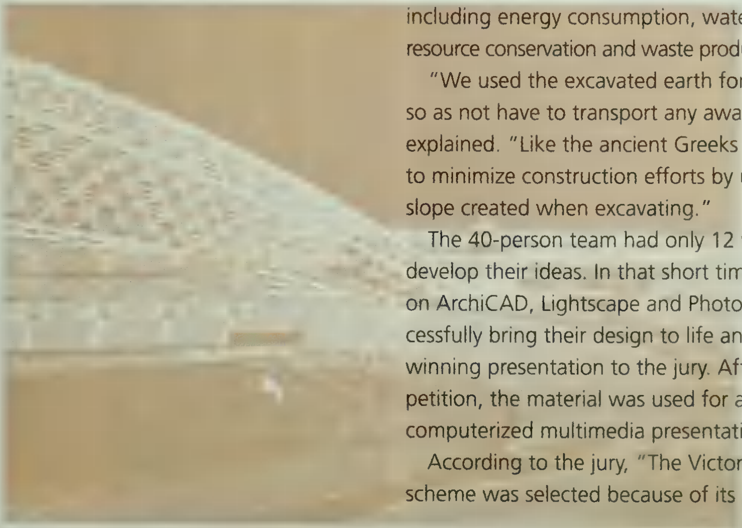
Berg Architects
Stockholm, Sweden

Designed to resemble a Greek amphitheater proudly overlooking Stockholm, the Victoria Stadium created jointly by Berg Architects and Wingardh Architects was chosen from eight entries in an international competition to design a home for the 2004 Olympic Games.

Svante Berg, president of Berg Architects, was confident in his team's ability to win the competition. An ArchiCAD user since 1992, Berg relied on ArchiCAD's speed and seamless integration with other software. "The speed of ArchiCAD really helped in the early phases of the project. It was also important to have the ability to present it in a 3D form that was easily understood," Berg said.



The city of Stockholm organized the invited competition for the $333 million stadium in 1996 as part of its bid for the 2004 Olympics. Situated along the Hammarby waterfront, the stadium was required to seat 70,000 people and adapt to multiple events after the games when it would be converted into an indoor arena seating 35,000. The architects had to give special consideration to a range of environmental issues, including energy consumption, water and timber resource conservation and waste production.



"We used the excavated earth for landscaping, so as not have to transport any away," Berg explained. "Like the ancient Greeks we wanted to minimize construction efforts by using the slope created when excavating."

The 40-person team had only 12 weeks to develop their ideas. In that short time, they relied on ArchiCAD, Lightscape and Photoshop to successfully bring their design to life and deliver a winning presentation to the jury. After the competition, the material was used for an interactive, computerized multimedia presentation.

According to the jury, "The Victoria Stadium scheme was selected because of its amphitheater design solution which closes around the sports playing fields and yet opens to the wider world providing a view of the Olympic Village and a beautiful vista of Stockholm."

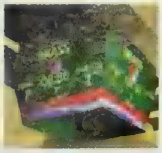
Berg's design calls for a thin, transparent roof over the grandstands, in deference to the Nordic tradition of integrating nature and design. "The Victoria Stadium is an ecologically sensitive and modern design meeting all of the city's environmental requirements for the Hammarby waterfront," Berg stated.

Founded in 1958, Berg Architects employs 18 people and has been involved with such diverse projects as infrastructures, airports and public buildings. The firm recently used ArchiCAD for feasibility studies, for client presentations and acquiring building permits for their new Mango design for the Norwegian oil company Statoil.

> "The speed of ArchiCAD really helped in the early phases of the project. It was also important to have the ability to present it in a 3D form that was easily understood."

# New Orleans Transforms Landmark Auditorium

Haynes + Associates – New Orleans, LA



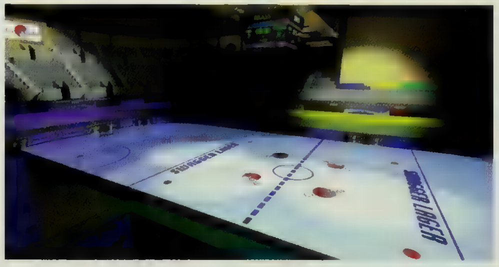
When the city of New Orleans needed to transform one of their historic treasures into a multi-purpose arena and auditorium, they wanted to visualize what it would look like before construction began. Using ArchiCAD, local architects Haynes + Associates took city officials on a "virtual tour" of the building. The city could see exactly how their money was going to be spent.

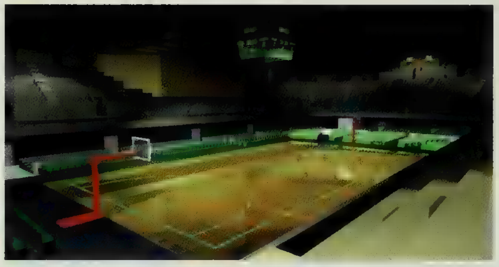
The Morris F.X. Jeff Municipal Auditorium, erected in 1930s New Orleans adjacent to the French Quarter, was used for Carnival Krewes Mardi Gras celebrations for 63 years. The city's decision to renovate was an economic one, fueled by the desire to bring more profitable events to the historic facility. The project was to build a regulation hockey rink inside the building flexible enough so that it could be converted back to an auditorium for other uses.

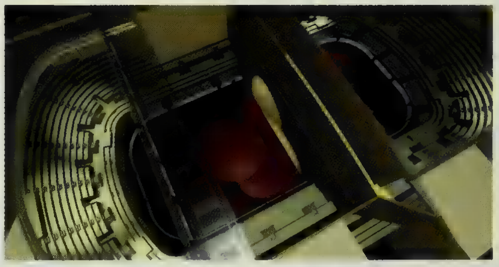
According to Paul Haynes, president of Haynes + Associates, the design challenge was the need for versatility. "The building can now go from a hockey rink, to a concert hall, to a basketball court, to a Mardi Gras ball setting in a one-day turnaround." In addition to the rigors of an accelerated schedule, another challenge was to place a modern venue inside a cultural landmark. "It raised a lot of issues concerning how to protect the historic value of the building," Haynes said.

> "We placed ourselves in the design to see what a game would look like from the seats..."

Within a week after winning the project, the auditorium was modeled in ArchiCAD. Renderings were created using Art•lantis Render, a ray-trace rendering program, to provide the realistic visualization required by the client. "The visualization allowed us to communicate the effects on the building quickly so they could understand what was going to happen," Haynes said. "Within the first month we were able to generate answers to all of their design questions. We knew what we were showing in ArchiCAD was accurate. In addition to doing construction documents it was a very persuasive and powerful tool for visualization."







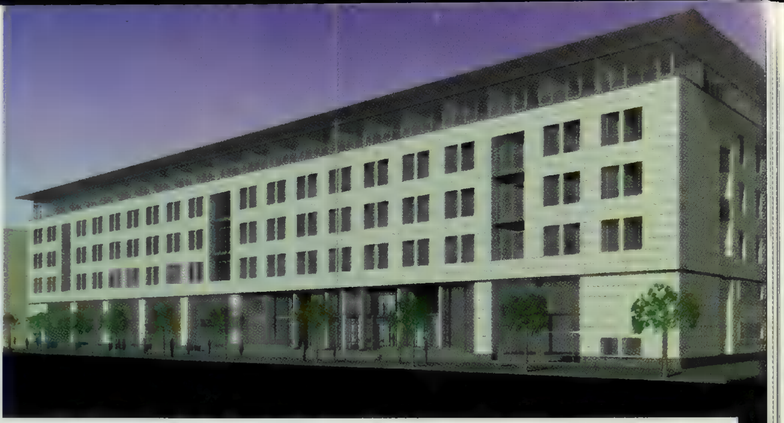
Testing the sight lines of the arena in ArchiCAD was another critical step for insuring accuracy. It was important that fans could see each player on the rink from any seat in the arena. "We placed ourselves in the design to see what a game would look like from the seats and could see potential problems immediately," Haynes said. "We ended up taking a whole section of seats out because of this. ArchiCAD helped us to avoid a catastrophe."

3D renderings allowed the city to choose between varied scoreboard styles. Advertising space was also displayed "virtually" so potential advertisers could view banners from different vantages throughout the arena. "ArchiCAD was used as a marketing tool not only for us but for the city as well," Haynes said.

Completed in October of 1997, the newly renovated 200,000 square-foot building features a 5,000-seat arena and is the new home of The New Orleans Brass, a minor league hockey team of the East Coast Hockey League. Concluded Haynes, "This project really led to the rejuvenation of the building, and had a positive impact on people's perception of what New Orleans has to offer."

# East Turns West in New Office Building

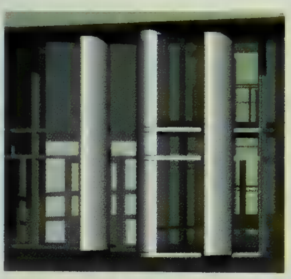
Alexander Kolbe Architects
Berlin, Germany

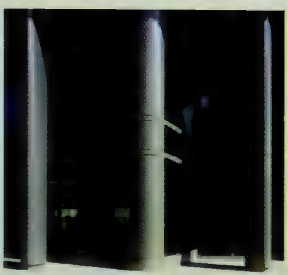


The former East German Ministry of Foreign and Domestic Trade building in Berlin needed to be converted into a new office building for members of the German Parliament. The building's location on Berlin Unter den Linden, one of the city's most distinguished avenues, posed many challenges for architect Alexander Kolbe. "We invested a lot in this job," Kolbe said. "Although it was a renovation project, we tried to redesign the whole building in every detail."

Taking on his most significant and complex project in 1991 at the young age of 29, Kolbe knew he needed to enlist the help of a 3D CAD system. Through his research he found ArchiCAD. "Its ease of use, coupled with the fact that Graphisoft took the needs and requests of its users into consideration in every software update, was the reason we chose ArchiCAD," Kolbe reported.

Because the building's structure was sound, a decision was made to keep the concrete frame intact and replace all of the facades and interiors. The Parliament dictated strict space requirements for the building's 33,000 m2 (348,000-square-foot) area, while the new facades had to win the approval of both the senate building director and the Office of Protection of Historical Monuments.





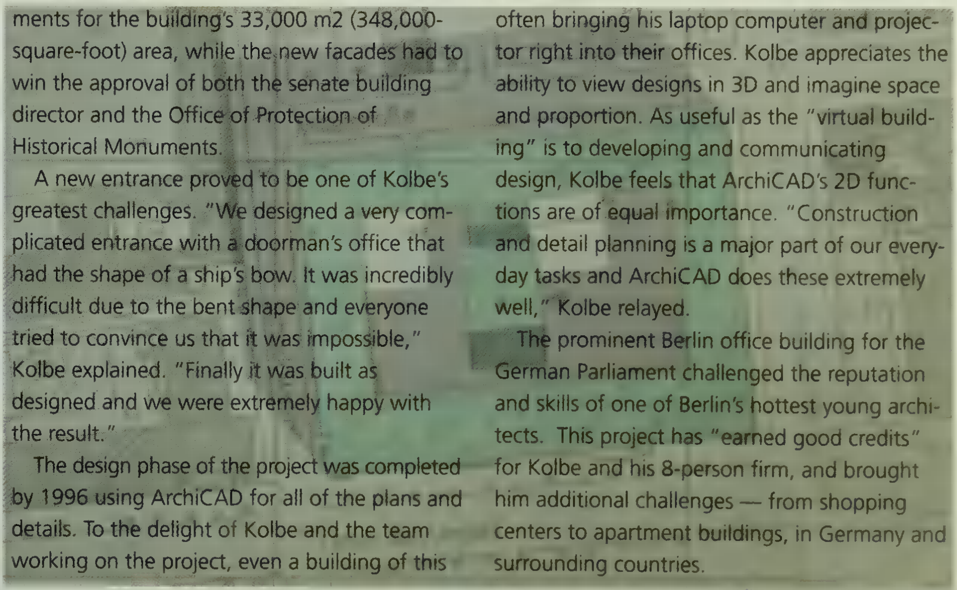
A new entrance proved to be one of Kolbe's greatest challenges. "We designed a very complicated entrance with a doorman's office that had the shape of a ship's bow. It was incredibly difficult due to the bent shape and everyone tried to convince us that it was impossible," Kolbe explained. "Finally it was built as designed and we were extremely happy with the result."

The design phase of the project was completed by 1996 using ArchiCAD for all of the plans and details. To the delight of Kolbe and the team working on the project, even a building of this size in all of its complexity could be kept as a single building model in one file. Added Kolbe, "And with the TeamWork functionality, this is even more efficient because I now have the option of working together with other people on the same building model at the same time."

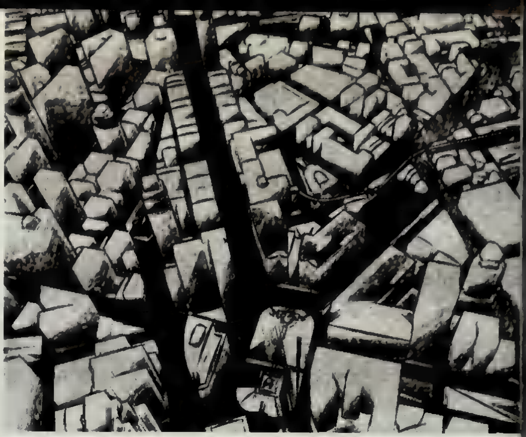
> "Although it was a renovation project, we tried to redesign the whole building in every detail."

On almost every project, Kolbe employs ArchiCAD's 3D presentation tools — renderings, animations and QuickTime® VRs — to sell sometimes unconventional ideas to clients, often bringing his laptop computer and projector right into their offices. Kolbe appreciates the ability to view designs in 3D and imagine space and proportion. As useful as the "virtual building" is to developing and communicating design, Kolbe feels that ArchiCAD's 2D functions are of equal importance. "Construction and detail planning is a major part of our everyday tasks and ArchiCAD does these extremely well," Kolbe relayed.

The prominent Berlin office building for the German Parliament challenged the reputation and skills of one of Berlin's hottest young architects. This project has "earned good credits" for Kolbe and his 8-person firm, and brought him additional challenges — from shopping centers to apartment buildings, in Germany and surrounding countries.



"The new LiveStyles rendering engines ... help people visualize projects in a familiar and non-threatening way."

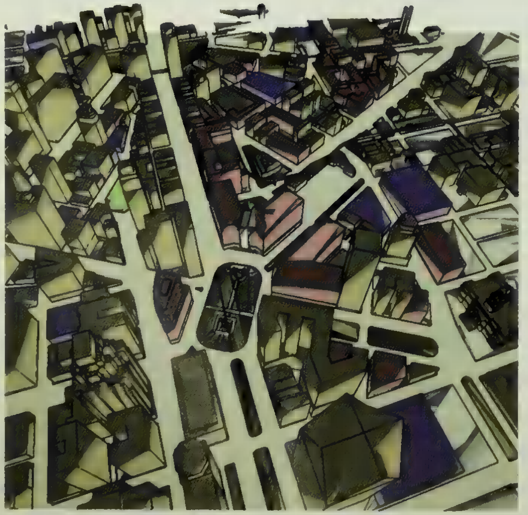


# Soft Plan for Downtown Detroit

Urban Strategies Inc.
Toronto, Canada

Toronto-based urban design firm Urban Strategies Inc. utilized ArchiCAD to transform a 2D DXF file into a 3D model of downtown Detroit in just a few weeks. Michel Trocmé, an associate with the 24-person firm leading the Detroit study, is planning a reinvestment strategy for the city's 5-square-mile downtown area over the next 10 to 20 years, which will be presented to a diverse constituency. "We don't want to mislead people with detailed views when it is uncertain what the city will look like in 20 years. That's why the regular hard-line rendering associated with CAD isn't necessarily appropriate," Trocmé said. "With urban development, you need to get the feel of the open spaces and the relationship between the buildings. It's not about the buildings themselves."

Working from their "virtual building" ArchiCAD model, the firm used ArchiCAD's new LiveStyle™ rendering engines to keep the visuals simple and loose and help stakeholders better understand the design. "The new LiveStyles rendering engines are a brilliant move from Graphisoft. This new development will help people to visualize projects in a familiar and non-threatening way. There is a definite need out there for hand-sketched presentations," Trocmé said.



Using a laptop and an overhead projector, Trocmé routinely walks his clients through projects using ArchiCAD's VR (virtual reality) technology. "Some clients have never seen anything like this before," he said. "And now with LiveStyles, we have the ability to create impressionistic VRs."

The downtown Detroit reinvestment strategy is intended to establish a redevelopment framework and identify key investment opportunities that aim to revitalize the pedestrian environment, reconnect the downtown to the riverfront, and attract new residential, retail, and office developments. Four districts within greater downtown Detroit are being studied, re-envisioned and targeted for strategic investment.

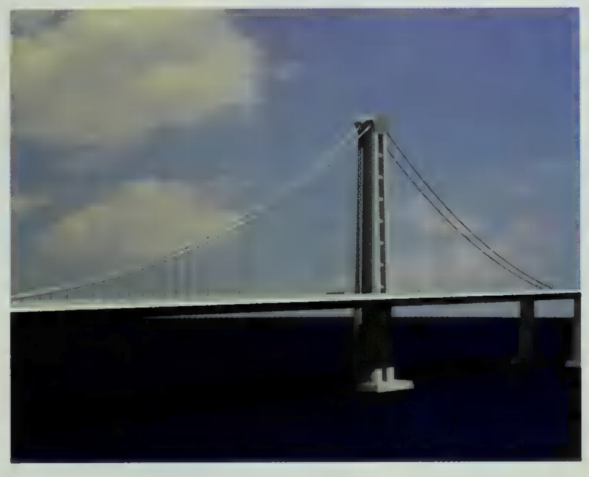
The downtown area has been struggling to recover from steady decline and lack of investment coupled with the loss of one half (one million residents) of its population since the 1950s. "In urban planning, projects tend to have an afterlife. The project has to make sense in an economic, social and environmental perspective that outlives political situations. It requires a different way of thinking," Trocmé said.

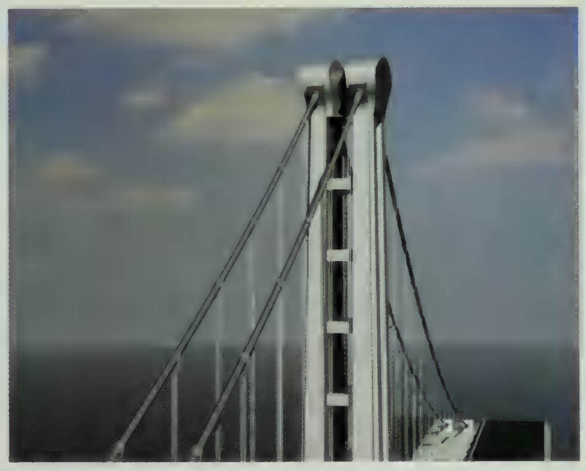
In Lower Woodward, the heart of downtown, the design re-introduces an element of Detroit's original plan — the public square of Campus Martius sits adjacent to an emerging community of loft apartments, galleries and restaurants. Responding to an RFP produced by Urban Strategies, developers are poised to build as much as 2 million square feet of commercial space around Campus Martius. "Rather than individual, stand-alone projects, such as a couple of tall buildings that would have no impact on the area, we're squashing it down and spreading it out to encourage place making and city building," Trocmé said.

Urban Strategies began using ArchiCAD in 1994, recognizing that ArchiCAD's software development was moving faster than other available CAD systems. Trocmé feels that having the city plan in ArchiCAD is the lifeblood of a project but the 3D views are almost as important. "3D has previously been secondary to the plans but that is changing now as there are more and more uses for it."

# New Landmark Bridges Bay

Donald MacDonald Architects
San Francisco, CA





To non-residents of San Francisco, it may be surprising that the design of a new, more earthquake-resistant Bay Bridge is only now nearing completion nine years after the 1989 Loma Prieta earthquake. But for residents of this city encumbered by politics and special interest groups, replacement of the 58-year-old span cannot be over-studied, over-discussed or over-designed.

Currently on the boards (or on the screens) are four alternative designs for the two-mile long, $1.2 billion east span of the San Francisco-Oakland Bay Bridge, slated to begin construction in the year 2000 and open in 2003-2004. Under the aegis of the California Department of Transporation and T.Y. Linn International, the San Francisco architectural firm Donald MacDonald Architects is developing two of the bridge designs using ArchiCAD.

"You get 3D results instantly with ArchiCAD, which is crucial in the early design stage," MacDonald said. With the help of ArchiCAD, MacDonald's team modeled and presented six suspension bridge schemes to the Bay Bridge Design Task Force and Engineering and Design Advisory Panel in only four weeks.

In addition to the obvious requirement of earthquake resistance — the two mile span must withstand an earthquake of 8.3 on the Richter scale — MacDonald had to include a bike lane, study views for both cyclists and motorists, consider the effects of added pollution to the Bay and adjacent Oakland wetlands, and accomodate the constraints of navigation channels and setting foundations on the Bay's muddy floor.

MacDonald notes that the bridge design should work in the context of the man-made environment. "The designs are based not only on how to carry the stresses, but also the context in which they are placed. We decided to keep the necklace of suspension bridges across the Bay intact to keep the continuity of design. It is more modern but similar in scale," MacDonald said.

Bridge design is not new to MacDonald. A recently completed project to retrofit the Golden Gate Bridge afforded him the opportunity to further understand not only the engineering and architectural principles which drive design, but the social awareness surrounding a national landmark as well. Since opening his practice in 1965, MacDonald has received numerous awards for such diverse projects as low- to middle-income housing, bridge design, urban infill and commercial projects.

The Bay Bridge Design Task Force commissioned two teams to develop designs for self-anchored suspension and cable-stayed bridges. MacDonald's team developed six suspension designs while another team within T.Y. Linn's office developed the cable stay schemes. After an initial review in early March, two suspension — a twin tower and a single tower — and two cable stay designs were selected for further development. If chosen, the single-tower, self-anchored suspension bridge (shown at left) would be the first in the world. The task force is scheduled to select among the four designs in June of 1998.

Having used ArchiCAD for many projects in the past two years, MacDonald appreciates that he can keep his overhead low thanks to the software's efficiency. "I'm able to keep my office lean and productive now," MacDonald said. "You can get started so quickly because the learning curve is so much shorter than other CAD programs."

> "You get 3D results instantly with ArchiCAD, which is crucial in the early design stage."

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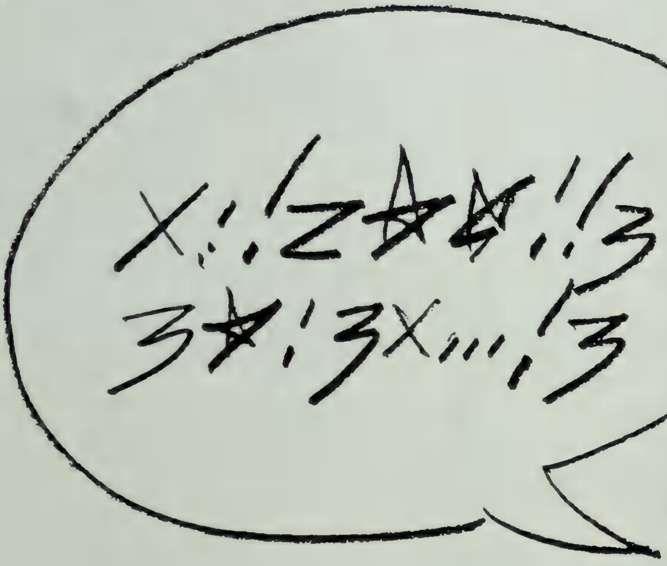

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**With commercial vacancy rates diving, rents rising, and office managers scrutinizing use of space, there is a great demand for products that store more items in less space. Homeowners, too, are clamoring for better storage options, and sophisticated consumer tastes have resulted in more attractive designs, as can be seen on the following page. Also highlighted here is the latest offering from Steelcase—the long-awaited Pathways collection of office furniture and interior architecture—and a new AC gearless elevator system from Montgomery-KONE that should have the industry buzzing.** ***Elana H. Frankel, New Products Editor***

## SAVING STORAGE SPACE: THE LATEST IN FILE DRAWER FASHION

In many cases, the computer revolution has created more information storage problems than it has solved. Offices now generate and store more paper, impeding efforts to streamline the workplace. The paper has to go somewhere, and that has often meant the proliferation of space-eating file cabinets. One solution is mobile aisle storage systems, which not only take up less space than file cabinets, but also incorporate sophisticated technology to meet accounting, security, and safety needs.

In a mobile aisle system, carriages of shelves are bunched together, leaving the files inaccessible until someone moves one of the carriages on its tracks to create an access aisle. With only one aisle open at a time, the system can pack two to three times as many items (files, videotapes, or X-rays, for example) into the same footprint as conventional systems. The carriages can be moved manually—by mechanically assisted handcranks geared to high ratios—or automatically by motors.

Computer software can be used to track the stored items, opening the carriage system to the proper spot when an item is selected on the screen from a remote PC. When users are required to enter a password for access, either at the PC station or on interfaces on each carriage, the software can keep track of who last held what file. Bar-code technology can also be applied to the system.

Sharon Hyder, a records management consultant based in Glendale, California, estimates that 99 percent of misfile incidents—each costing $125 to $150 in lost resources—can be eliminated with such new accounting mechanisms in place. Combining the savings that accrue from efficient tracking methods and better use of space, a company can recoup its investment in a mobile aisle system within 10 months of purchase, says Hyder.

Security on these systems far exceeds what is available for file drawers. Users can be required to log in with a password before the carriages will move. More expensive methods such as infrared sensors and photo scanners are also available to detect the presence of anyone within the aisle space.

Putting hulking shelves in motion may make for a dangerous situation. Most mobile aisle systems on the market do not allow more than one aisle to be open at a time. Those systems with infrared sensors can detect whether someone is in an aisle and will lock all the carriages in place until the filing is complete. Some systems require a user to log out of an aisle before another one can be opened. The carriages on all systems stop in response to pressure, either at track or shelf level.

These mobile filing systems can be paneled with various materials, including the full range of Wilsonart laminate colors. Cables and wires are kept out of sight in armatures above the carriages. As for extra flourishes, Holga's Roll-X system rounds the corners of its carriages. Nordplan's Scandi Line 9000 system (below) has computers in each carriage, allowing users to readjust the position of stationary carriages in each setup.

Apart from the quality of construction and, therefore, the cost, there is little differentiation among the various systems—which are produced by such manufacturers as Office Speciality, Spacesaver, Holga, Nordplan, Kardex (inset), and Equipto—although not all features are available with all models.

For more industrial applications, Stanley Storage offers a vertical equivalent of the mobile aisle system that takes advantage of the large empty overhead spaces in warehouses. The appropriate drawer comes to ground level when a code is entered at a PC or carriage interface. Office managers would do well to adapt it for their use, conquering ever more space for storage. *David Simon Morton*

**Mobile aisle storage systems can hold two to three times as many items as traditional file systems because carriages can be separated to form a single accessible aisle.**

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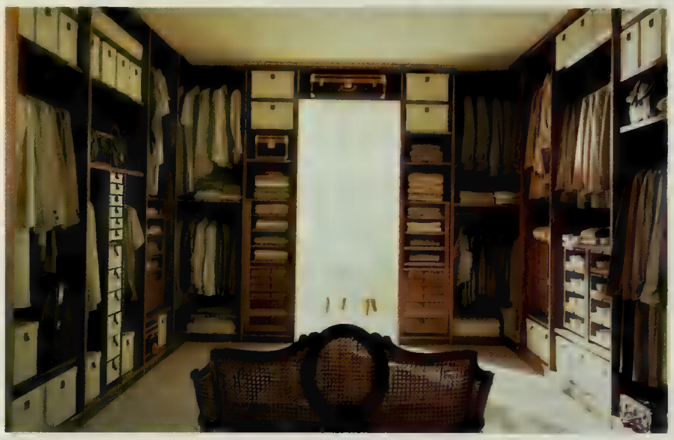
Holga, Van Nuys, Calif.
818/782-0600. **CIRCLE 297**
Kardex Systems, Marietta, Ohio
800/234-3654. **CIRCLE 298**
Nordplan USA, Conshohocken, Pa.
800/992-2795. **CIRCLE 299**
Office Specialty, Holland Landing, Ont.
905/836-7676 **CIRCLE 300**
Spacesaver, Fort Atkinson, Wis.
800/492-3434. **CIRCLE 301**
Stanley Storage, Allentown, Pa.
800/523-9462. **CIRCLE 302**

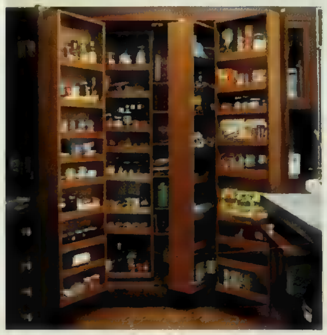
## EXPANDING SPACE WITH MORE CHOICES

Manufacturers are providing more storage product options in the marketplace, increasing the number of available colors, materials, and add-ons. Storage products are also being made in more convenient forms, so that they can be easily stored or transported themselves. Most important, many new storage systems—such as the following examples—have a high degree of modularity, allowing them to be customized to meet specific needs. *D.S.M.*

### ► Clothing closet

The Cabina Armadia, part of Poliform's Senzafina collection of floor-mounted modular shelving systems, is designed to make the closet feel and function like a large piece of furniture. The elegant system offers glass-front drawers, shelf space over doors, glide-out trays, and a choice of leaf, folding, sliding, or concertina for the interior doors. The frame comes in white, walnut, and beech melamine, as does the interior, which is also available in an elegant staved walnut. 888/POLIFORM. Poliform USA, New York City. **CIRCLE 303**



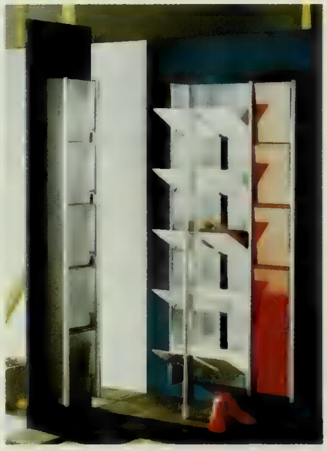


### ▲ Food for thought

Independent architect Ronald Berlin designed this pantry for a New Jersey home. Not wanting to sacrifice kitchen space for storage, the architect integrated the pantry into cabinetry only 24 inches deep and 42 inches wide, a space slightly larger than that taken up by a standard refrigerator. Three layers of shelving, each of a different depth, are enclosed. The forward two layers swing out on sturdy piano hinges; the front layer of shelves forms the inside of the cabinet door. 609/921-1800. Ronald Berlin, Princeton, N.J. **CIRCLE 304**

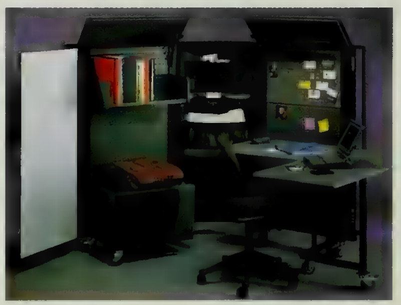
### ▼ If the shoe fits...

The shelves of the larger shoe rack shown below retract into the wall with the touch of a rod that joins them. Those on the smaller model are weighted to retract when empty. Shelves come in red, black, blue, and white, and the casings come in galvanized steel or black powder-coat steel. 914/764-5679. Rais & Wittus, Pound Ridge, N.Y. **CIRCLE 305**



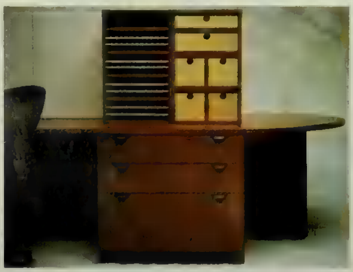
### ► A perfect fold

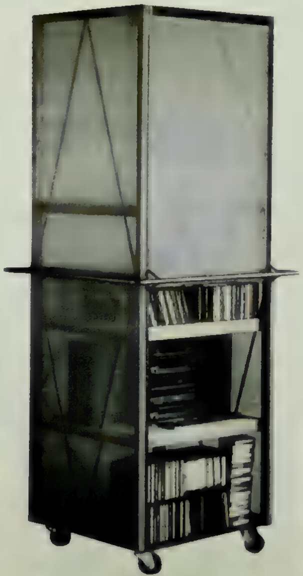
Herman Miller's Puzzle mobile office unit arrives completely assembled, and need never be taken apart. Measuring 5 feet high, 7 feet wide, and 5 feet deep, it folds into a five-by-two-by-three-foot box, small enough to fit in a closet or ship to another site. For a short move, lockable casters allow the 300-pound box to be easily wheeled around. The surfaces are covered in black vinyl and the steel frame is finished in graphite. A nylon bag is available to seal up the office, protecting it from dust and scratches. All the features of a conventional office are built in: tackable, magnetic, and white marker boards; a lockable lateral file; a task light; four storage pouches; shelves; and a mail slot. A single 15-foot extension cord supplies power. No tools are necessary for setup. 800/851-1196. Herman Miller, Zeeland, Mich. **CIRCLE 306**



### ► Fine grain storage

The new Keyeira line of open plan furniture from Geiger Brickel is distinguished by the variety of fine flat-cut wood that can be specified: maple, cherry, birch, sapele, beech, or even custom selections. The system has components common to open plans—fixed and mobile storage pedestals, overhead cabinets, horizontal shelving—but its styling is a bit more classic. Cabinet doors don't roll or flip up; they open on hinges. Everything is protected by a urethane finish. 800/444-8812. Geiger Brickel, Atlanta. **CIRCLE 307**

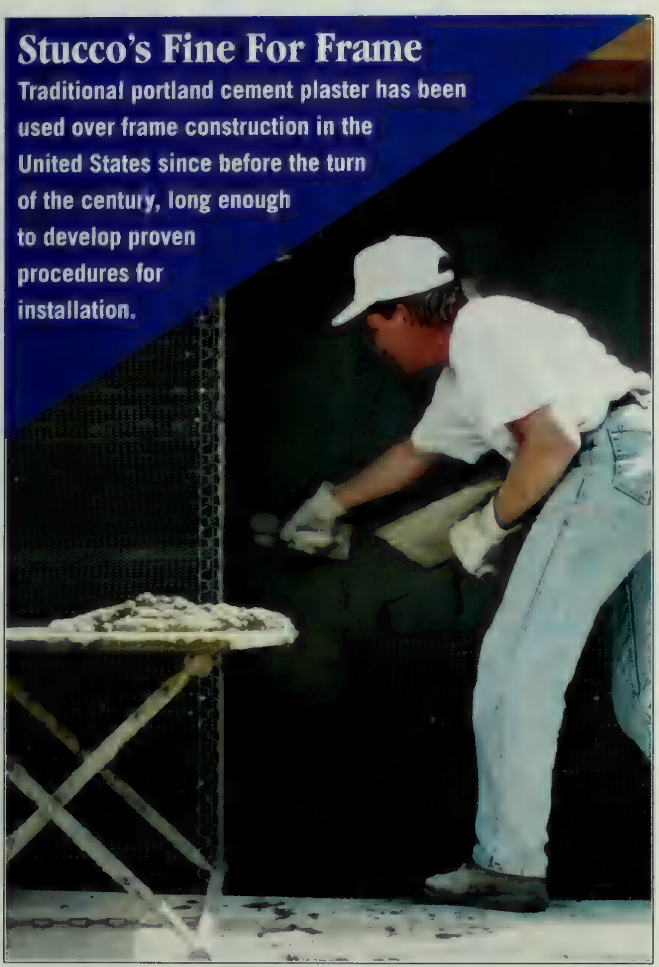




### ◄ A television tower

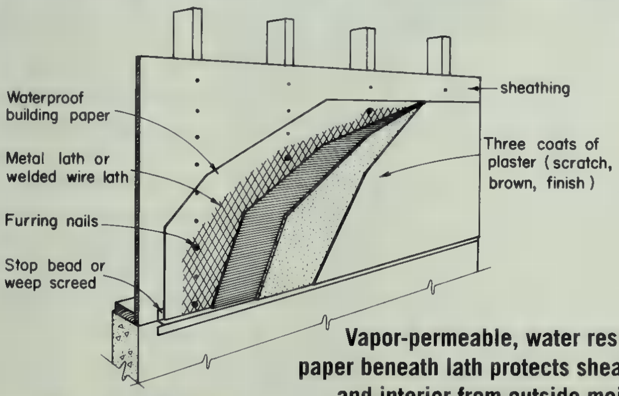
This television and stereo stand by Alan Sklansky, a San Francisco–based architect and furniture designer, appears to be built from the ground up, with steel framing and supports. But like other Modernist gestures of function, this one is illusory: the supports are for show. The fiberglass front and back panels on the top half of the unit are covered with brass mesh and slide vertically. Three blond plywood shelves are fixed in place, and more shelves can be added to fit in between. The stand, which measures 40 inches wide, 76 inches high, and 24 inches deep, is balanced to hold a television on the third shelf, despite the high altitude. 212/253-0111. Christina Modern, New York City. **CIRCLE 308**

# IT'S TIME TO RETHINK STUCCO



## Stucco's Fine For Frame

Traditional portland cement plaster has been used over frame construction in the United States since before the turn of the century, long enough to develop proven procedures for installation.


sheathing
Waterproof building paper
Metal lath or welded wire lath
Furring nails
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Three coats of plaster (scratch, brown, finish)

Vapor-permeable, water resistant paper beneath lath protects sheathing and interior from outside moisture without trapping moisture vapor in wall

## The Real Thing

Traditional portland cement plaster is a time-tested exterior finish. It consists of portland cement-based materials and sand, mixed with water to form a workable plaster. Portland cement provides strength, durability, and toughness in portland cement plaster.

## It's Not the Same as Synthetic Stucco

Portland cement plaster (sometimes called "traditional stucco") should not be confused with exterior insulation and finish systems (EIFS) or "synthetic stucco systems." Traditional stucco has high impact resistance and sheds water, but breathes, allowing water vapor to escape. It's a proven system that works in all climates.

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## RETHINKING WORK IN THE OFFICE; REWORKING SPACE FOR PRODUCTIVITY

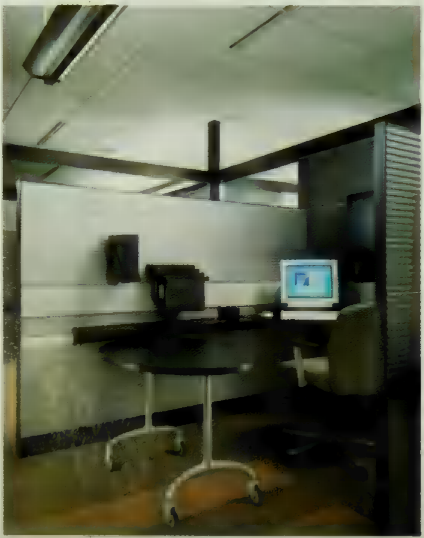
To keep up with the latest corporate trend of open workspaces, Steelcase's ambitious new line of office products, Pathways, attempts to speak to the needs of executives who have to plan for adequate communal and teaming spaces, the integration of technology, and long-term flexibility.

### The new workspace

The Pathways approach to space allocation includes an interior architecture system (a basic framing infrastructure), freestanding furniture and storage towers, and mobile tables and file carts that can be moved to accommodate formal or informal meetings. Makeshift private offices, for example, can double as group meeting spaces. To address the need for visual and acoustical privacy, Pathways includes systems for creating shared private offices, as well as mobile nylon visual shields and Armstrong's UL-certified acoustical ceiling tile.

A Pathways office environment offers a number of ways to access power. A post-and-beam system, Conjunction, with wiring and cabling integrated into the system, can be attached to walls or remain freestanding to define space. Steelcase and Tate Flooring have partnered to create a raised-floor system called ConCore 1000, which distributes power, voice, data, and HVAC services to individual work spaces. Quotient is a floor-to-ceiling wall product that provides workstations with access to power.

Only a fraction of the Pathways products are mentioned here, and potential buyers should be forewarned: when talking to a Steelcase dealer, you'll need the company's phrase book to keep track of all the product names. 800/227-2960. Steelcase, Grand Rapids, Mich. **CIRCLE 352**

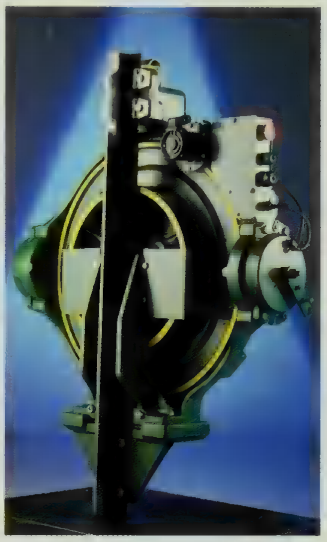


## THE LATEST IN ELEVATOR DESIGN: AN ECO-FRIENDLY, AC GEARLESS SYSTEM

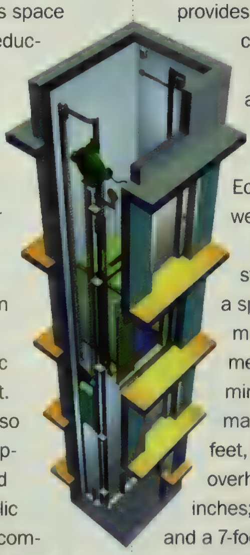
Traditionally, architects have had limited choices when it comes to elevator systems. They could either specify a hydraulic elevator, which relies on hydraulic oil that could eventually leak into the ground, or traction, which requires the addition of a penthouse unit to a building as well as large structural loads placed on top of it. Now, with the new EcoSystem from Montgomery-KONE, there is a more environmentally friendly, cost-saving alternative for low- and mid-rise buildings.

The AC gearless EcoSystem is powered by EcoDisc, a compact machine design that integrates the traction sheave, brake flange, and rotor into a single flat, thin design with two independent brakes. No hydraulic oil or additional building space is needed. "All EcoSystem products—EcoSpace and MonoSpace being the original launch products—are built with EcoDisc," says Eric Rupe, communications director for Montgomery-KONE. "It's a slim, synchronous axial motor built with permanent magnets. This disc is what makes space savings possible." By reducing machine room requirements and thus avoiding the use of laborious, expensive crane systems, EcoSystem lowers elevator construction costs. It also eliminates time-consuming coordination issues such as hole drilling (for the hydraulic lift) and jack placement.

EcoSystem can also reduce energy consumption by almost one-third (compared with hydraulic elevators) to one-half (compared with traction) because of the downsized power supply and low energy consumption. But even with reduced energy use, "it still provides the performance reliability and ride quality associated with AC gearless elevators," Rupe explains.



**EcoDisc (above), a small, slim synchronous axial motor built with permanent magnets, is what makes space savings possible with the EcoSystem products.**



In conjunction with the launch of EcoSystem, Montgomery-KONE has released a CD-ROM that calculates project cost savings and provides information on the company's Web site, which can be found at www.montgomery-kone.com.

The specifications for EcoSystem include a weight capacity of 2,000 to 2,500 pounds (NEII standard platform sizes); a speed of 200 feet per minute; travel measurements of 8 feet, 4 inches minimum and 80 feet maximum; a pit depth of 5 feet, 6 inches; a minimum overhead of 12 feet, 9 inches; a standard 8-foot cab; and a 7-foot entrance.

While freeing up building space for other uses and reducing costs and potential environmental hazards, EcoSystem provides a high-performance and quiet elevator ride. 800/956-KONE, Montgomery-KONE, Moline, Ill. **CIRCLE 353**

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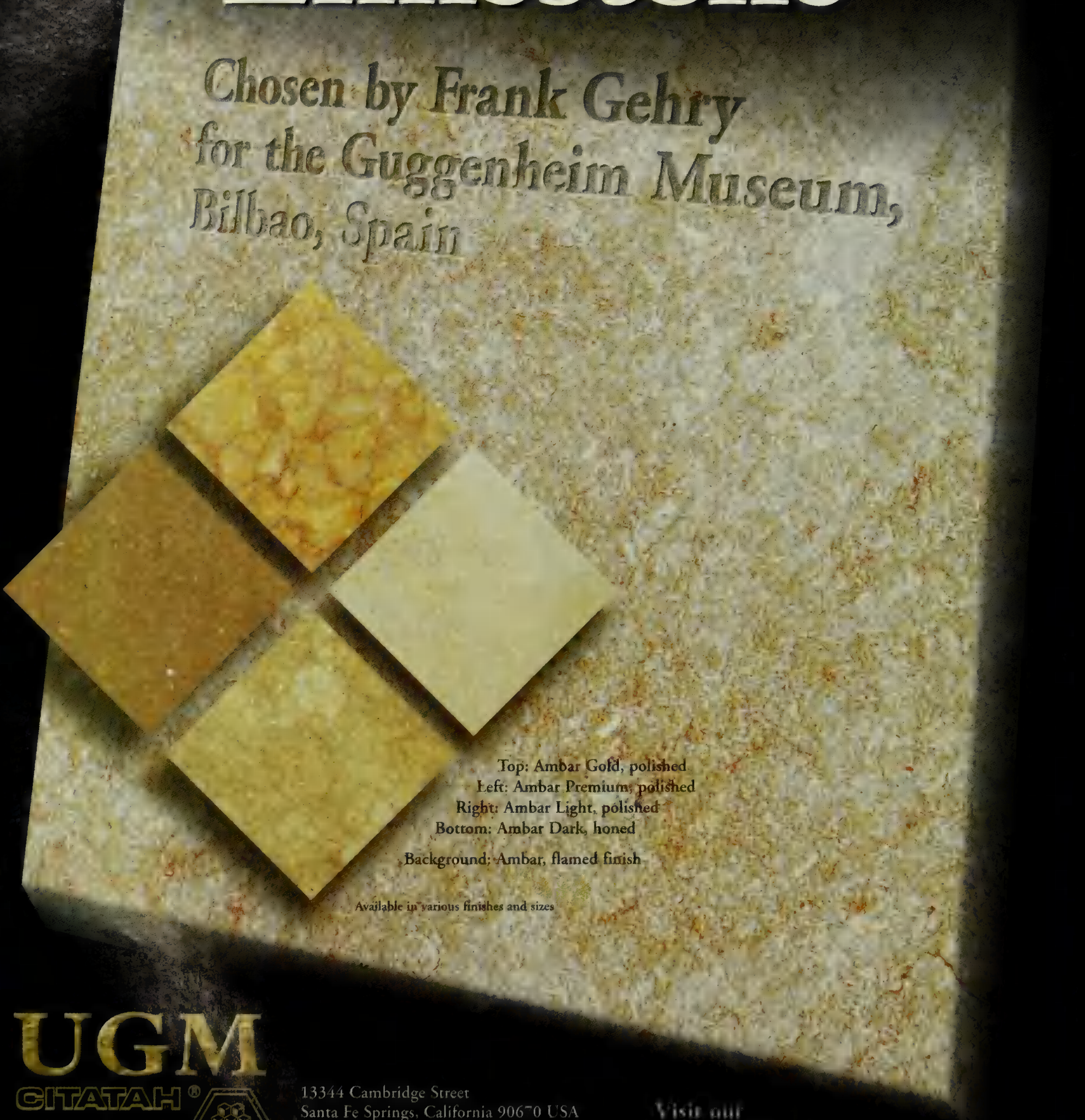

# Museum Quality Limestone

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for the Guggenheim Museum,
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Left: Ambar Premium, polished
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Bottom: Ambar Dark, honed

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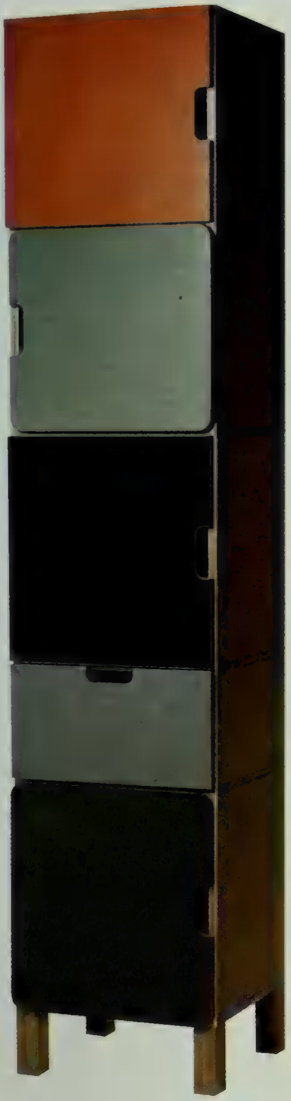
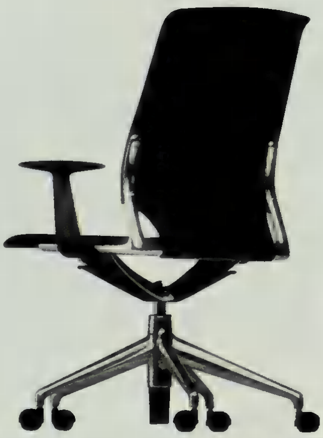


### ▲ Tall order

Totem Design Group's ongoing relationship with various manufacturers around the country has resulted in a collection of American-designed furniture and lighting products. Included in this new venture is work from Lloyd Schwan's Low collection (upholstered sofas and chairs) and Surface collection (casegoods and tables). Most notable is this five-tiered Tall Cabinet, which is also available in a slightly different configuration with open shelving. Made from Finn-Ply and Wilsonart plastic laminate, the cabinet shown here measures 87 inches high, 16 wide, and 14 deep. Watch for other Schwan pieces in the future for the Italian company Cappellini. 212/925-5506. Totem, New York City. **CIRCLE 267**

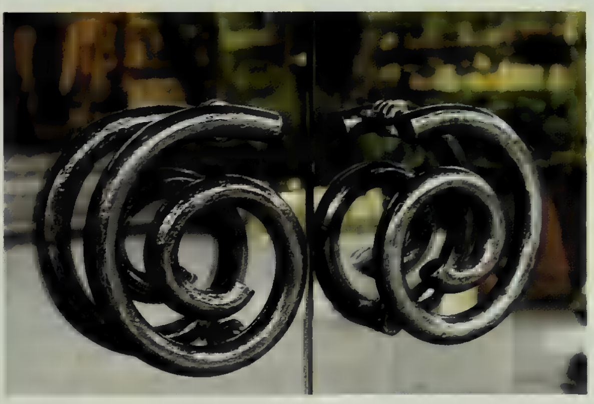
### ▼ Design-conscious decking

Made from recycled milk jugs and recovered wood fiber, Smart Deck Systems (a division of Eaglebrook Products) include railings, column posts, balusters, top and bottom rails, and fascia boards that will not rot, warp, split, or splinter. To hide cabling or wiring, each composite is extruded with fluted channels, and the overall design eliminates exposed fasteners. SmartDeck weathers like natural lumber into a driftwood-gray color. 888/733-2546. SmartDeck, Chicago. **CIRCLE 309**



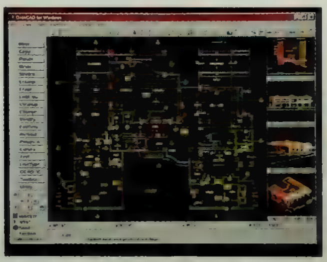
### ▲ In Vitra

Named after its designer, the ergonomic office chair by Alberto Meda sits on a five-star base with casters or gliders. Armrests can be upholstered in black leather and the back in Netweave, a mesh fabric. Other upholstery options include tesso. 800/33-VITRA. Vitra, New York City. **CIRCLE 310**



### ▲ Hammered by hand

Using traditional blacksmithing techniques, California designer Jefferson Mack forged these contemporary-styled iron door handles at 2,000 degrees. Then, the 1¼-inch roundbar was rolled into a 12-inch-diameter spiral. Finally, Mack hand-hammered the texture to create what he refers to as a unique set of Earthsake entry pulls. 415/550-9328. Jefferson Mack Metal, San Francisco. **CIRCLE 312**

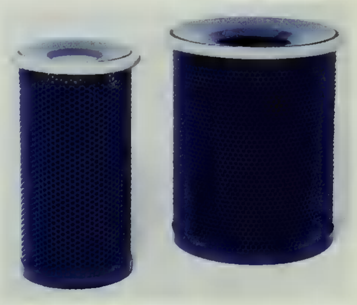


### ◄ DataCAD update

With the release of DataCAD 8 for Windows 95/NT (compatible with previous versions, sharing the same drawing files, templates, symbols, fonts, linetypes, hatch patterns, and DCAL macros), users can access the first 32-bit version of the 2D/3D CADD software. 800/394-2231. DataCAD, Avon, Conn. **CIRCLE 314**

### ▼ Want not, waste it

Metal-Form waste containers and ash urns from Wausau Tile add style and snap to an unglamorous and thankless task: taking out the trash. The 14-gauge perforated-steel containers come standard with cast-aluminum tops that easily snap out and polyethylene liners. Available in 10- and 31-gallon sizes as well as a variety of colors including yellow, green, brown, red, and blue. Also available freestanding or mounted. 800/446-8020. Wausau Tile, Wausau, Wis. **CIRCLE 311**

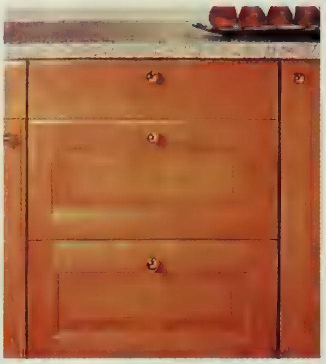


### ▼ Wok & roll

Viking Range's built-in gas wok measures 24 inches wide and 24 inches deep, standard cabinet depth. Components include a 20-inch stainless-steel wok with a top, a two-piece cast-iron removable surface burner grate, and a center trivet. The wok reaches 30,000 BTUs (restaurant caliber). Spills and grease are caught in a removable stainless-steel drip tray, which pulls out on roller-bearing glides. The wok is also available with optional brass trim on the drip tray pull, nameplate, and knob bezel. 888/845-4641. Viking Range, Greenwood, Miss. **CIRCLE 313**

*For more information, circle item numbers on Reader Service Card*

## PRODUCTBRIEFS



### ▲ Hidden beauty

Since it first introduced the electric dishwasher to Europe in 1929, Miele has been creating efficient and quiet dishwashers around the world. The fully integrated Miele dishwasher G879SCVi, shown, hides behind kitchen cabinetry, as do the control panels. To conserve energy, a top-only option washes the cutlery and top basket. The dishwasher holds a substantial 14-place setting and has separate specially designed areas for crystal and fine silver. 800/843-7231. Miele, Princeton, N.J. **CIRCLE 315**

### ▼ Parking patrons see the light

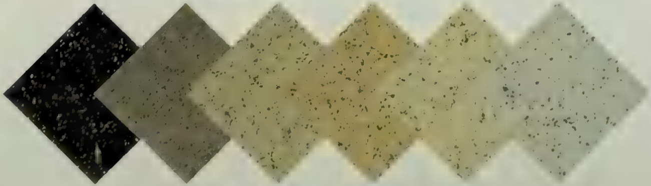
Inside the glass-block tower of the newly renovated parking garage at National Airport in Washington, D.C., the elevator banks feature Pittsburgh Corning's Essex line of lighted glass-block facings. Dubbed the "Wayfinder," the lighted glass-block configuration illuminates the points of entry into the garage and helps people find their way through the three levels of the parking garage. Another guiding light is the glass-block pylon (right foreground in photo), also from the Essex line, which serves as an information and help center. VUE pattern glass blocks were also used to create the rounded edges. 800/359-8433. Pittsburgh Corning, Pittsburgh. **CIRCLE 319**

### ▲ Old style new again

Domco's Azrock Linosom Linoleum provides a durable retro look that's environmentally friendly. Linoleum is homogeneous and easy to maintain and its single-layer structure of cork, wood, and linseed won't wear or fade over time. Also, it's flexible, making it easy to install, with less waste. 800/558-2240. Domco, Florence, Ala. **CIRCLE 320**

### ▼ Commercial VCT

Kentile's Kenstone, 12-by-12-by-⅛-inch vinyl composition tile (VCT), is available in six neutral solid colors textured with random contrasting flecks. Colors include coalstone black, hearthstone gray, claystone taupe, soapstone tan, sandstone beige, and limestone white. For 1998, the company also introduced KenColors (31 environmental hues) and asphalt-style VCT, reminiscent of marbleized asphalt tiles produced by Kentile earlier this century. 888/4-KENTILE. Kentile, Chicago. **CIRCLE 321**



### ▼ Management software

Axium's Protrax software for Windows 95 provides contract management, invoicing, and accounting support for AEC firms. 800/872-1540. Axium, Beaverton, Ore. **CIRCLE 316**

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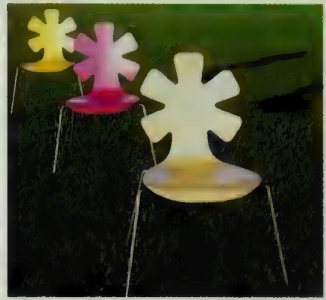
### ▼ Certified ceilings

All Armstrong commercial ceiling tiles for acoustical performance are now UL certified, making Armstrong the only company to meet the independent classification testing and monitoring program. This assures architects that the product will perform as specified, reducing much of the risk of callback and liability, particularly in open workspace environments. 888/CEILINGS. Armstrong, Lancaster, Pa. **CIRCLE 318**



### ▲ Punctuate a room

Lampa's Asterisk Chair, designed by sculptor and Pratt University professor Cliff Baldwin, is made of molded maple plywood and a steel base. The chair is available in five colors—cyan, magenta, yellow, black, and natural—and its overall measurements are 35 inches high, 19 inches wide, and 17 inches deep, with a seat width of 17½ inches. 516/722-9450. Lampa, Aquebogue, N.Y. **CIRCLE 317**

### ▲ Finish it off

The Hopper Company recently became the exclusive United States distributor of Algalite, an Italian line of wall-finishing products. And this happened just in time to cover 25,000 square feet of the J. Paul Getty Museum in Los Angeles with their Venetian product, a blend of polymers and cements that is applied with a trowel to produce a matte finish with subtle mottling. 602/273-1338. Hopper Company, Phoenix. **CIRCLE 322**

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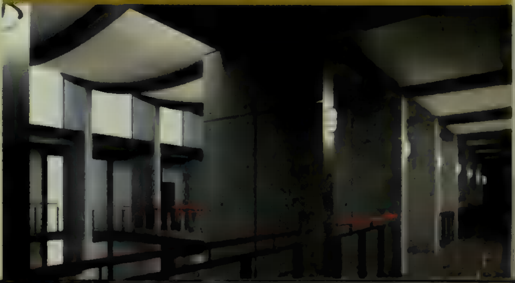
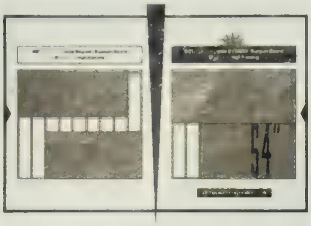


## PRODUCTBRIEFS



### ▲ Expanded gypsum board

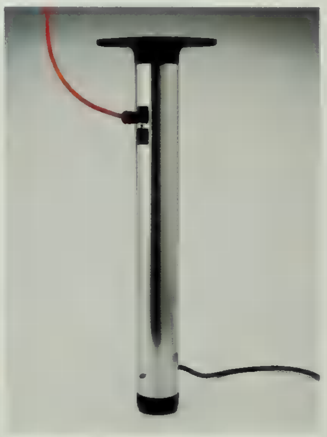
Georgia-Pacific Gypsum expanded its manufacturing and sales of 54-inch-wide GyProc Gypsum Board. While four-foot-wide board requires two horizontal joints on a nine-foot ceiling, 54-inch board installs with only one joint. Available in ½- and ⅝-inch thicknesses; lengths of 8 and 12 feet. 800/225-6119. Georgia-Pacific, Atlanta. **CIRCLE 323**

### ▲ Rooftop material

Rustic Shingles are made from an alloy that is 98 percent recycled aluminum (primarily beverage cans). Available in nine colors, they are typically installed directly over old roofing materials (including wood shingles on spaced sheathing) and look like authentic wood shake. Rustic Shingle is rustproof and lightweight (45 pounds per 100 square feet). The shingles were also proven by the Florida Solar Energy Center to reduce attic heat gain by up to 34 percent over composition roofing materials. 800/543-8938. Classic Products, Piqua, Ohio. **CIRCLE 324**

### ▼ Electric legs

The UL-listed Powered Milano Leg brings 110 volts to the desk. The leg, in matte black, polished chrome, or unfinished metal, has two duplex electrical outlets. The next generation will feature fourplex outlets. 800/523-1269. Doug Mockett & Company, Manhattan Beach, Calif. **CIRCLE 325**



### ▼ Ballpark design

With opening day for the 1998 baseball season attracting thousands of fans to Atlanta's Turner Field, home of the Braves, officials credit Schott's tempered Amiran anti-reflective glass for eliminating reflective glare in the ballpark. At four times the strength of regular Amiran, tempered Amiran also met local wind load restrictions. Available in sizes up to 84 by 141 inches. 914/968-1400. Schott, Yonkers, N.Y. **CIRCLE 326**

### ▲ Cork it up

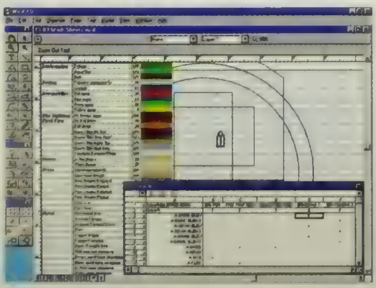
Originally founded in the late 19th century in Sweden, but currently based in Portugal, the cork capital of the world, Wicanders has a long European history of supplying cork floor to architects and designers for offices, retail spaces, and hotels. Now available in North America through Ipocork, cork flooring provides a cushioning effect that reduces noise. 800/828-2675. Ipocork/Wicanders, River Edge, N.J. **CIRCLE 327**

### ▼ Filter system

Metered valve design hasn't always allowed for filter use. Thanks to an engineering effort, the Dual-Filtered By-Pass is now part of Sloan's Flushometer valve. The filter and a backup prevent dirt from clogging the system and water from running out. 847/671-4300. Sloan, Franklin Park, Ill. **CIRCLE 328**

### ▼ Workflow technology

Based on Windows 95 Explorer's graphic user interface, Revision Master from Diehl Graphsoft tracks updates, revisions, and corrections to computer files. Users check files out of a library system, creating a changeable file, and then place the file in a specified location. No one else can make changes to the file until the original user checks it back into the system. This latest form of document control is an efficient way to locate, store, retrieve, and monitor changes to electronic documents. Revision Master will keep track of word-processing, spreadsheet, desktop publishing, CAD, and HTML files. 410/290-5114. Diehl Graphsoft, Columbia, Md. **CIRCLE 329**



### ▼ Workstation wary

There is a lot of scientific evidence pointing to the fact that the use of computers causes repetitive stress injury (RSI) and muscle fatigue. One of the main causes of RSI is poor keyboard positioning. One $380 solution is Ergo System's XK99, an ergonomically correct keyboard support system that fits under a desk. With the touch of pneumatic control levers, users can create a keyboard custom fit by lowering or raising the tray; tilting it forward or back; or swiveling it 360 degrees (or even pushing it completely out of the way). Will it foster office productivity? Yes, as it will surely keep people comfortably typing away at their desks. 860/282-9767. Ergo System, East Hartford, Conn. **CIRCLE 330**

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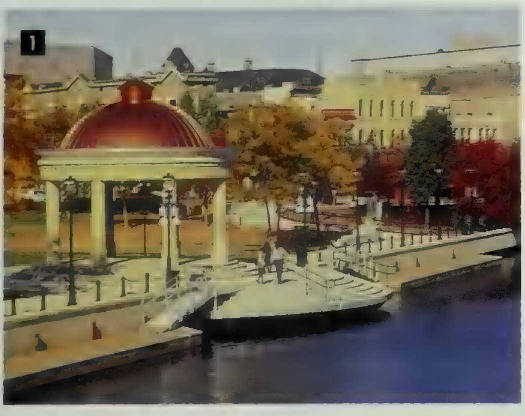

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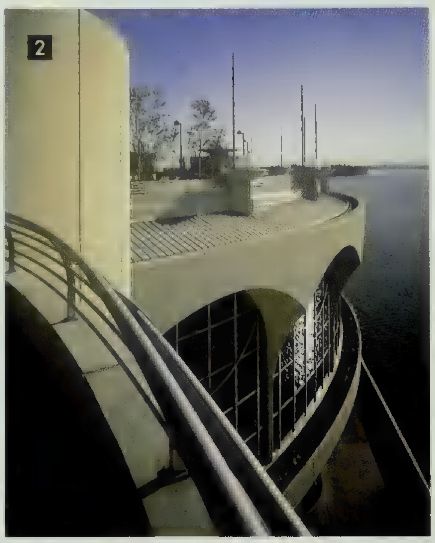

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***Manufacturing:*** International Concrete Products
Germantown, WI

2 ***Winner:*** Monona Terrace Convention & Community Center
***Design:*** Taliesin Architects, Ltd. & Potter Lawson Architects
***Manufacturing:*** International Concrete Products
Germantown, WI
***Photographer:*** Hedrich Blessing

3 ***Winner:*** Molecular Biology Building
***Design:*** Harper Kemps Clutts Parker Jennings Hackler & Partners
***Manufacturing:*** Continental Cast Stone Manufacturing, Inc.
Shawnee, KS

4 ***Special Commendation:*** The RSA Tower Office Building
***Design:*** PH&J Architects, Inc.
***Manufacturing:*** Castone Corporation
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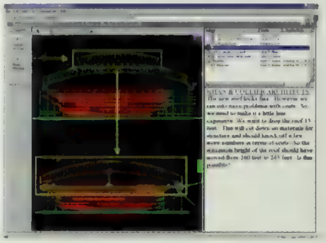
## PRODUCTBRIEFS

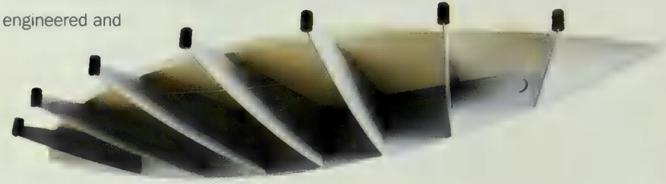
### ► Paperless office option

Express mail is a thing of the past with ReviewIt, a software package that is designed and marketed by ex-Autodesk developers at the West Coast start-up company Cubus. With this first-ever offering of collaborative design review software for the Internet, AutoCad users can now exchange, review, revise, and organize blueprints, drawings, and documents over the Internet. Users can pan, zoom, and mark up a design document and also view or create accompanying text messages. And the Cubus server guarantees high-level security. Available as a monthly subscription service. 510/654-5823. Cubus, Oakland, Calif. **CIRCLE 331**



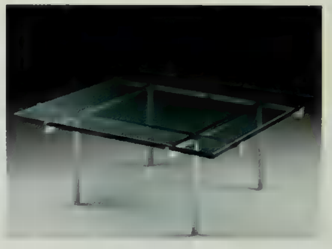
### ▼ Hanging around

Peter Pepper Products Artform collection includes this wall-mounted coatrack finished in stainless steel, chrome, aluminum, glass, or wood. Requiring a minimal amount of space, the rack is engineered and designed in Germany and has a sleek and modern look. Also available in the collection are a hat shelf, hangers, and matching wall tables. 310/639-0390. Peter Pepper Products, Compton, Calif. **CIRCLE 333**



### ▼ Custom carpet

Atlas Carpet has two new commercial products made of DuPont Antron Legacy nylon, which can be custom designed with a minimum order of 45 feet. Paletta, inspired by primitive stone rubbings, is available in 36 color combinations. Available in 24 colors, Brushworks, shown, was inspired by Oriental carpets. 800/372-6274. Atlas Carpet Mills, Los Angeles. **CIRCLE 332**



### ▲ Occasion for classic design

The top of the occasional Paris table from North Carolina–based Charles McMurray Designs is available in clear or etched glass, marble, granite, or veneered wood. It fits snugly within the base while seeming to float within its frame. The base of the table can be made of polished stainless steel, brass, or statuary bronze. Only solid ¾-inch bar stock is used, and 12 standard sizes—both square and round—are available. The table can also be custom made for corporate or residential environments. Remarkably simple in its design, the Paris table mixes well with previous collections. 800/438-4830. Charles McMurray Designs, Charlotte, N.C. **CIRCLE 334**

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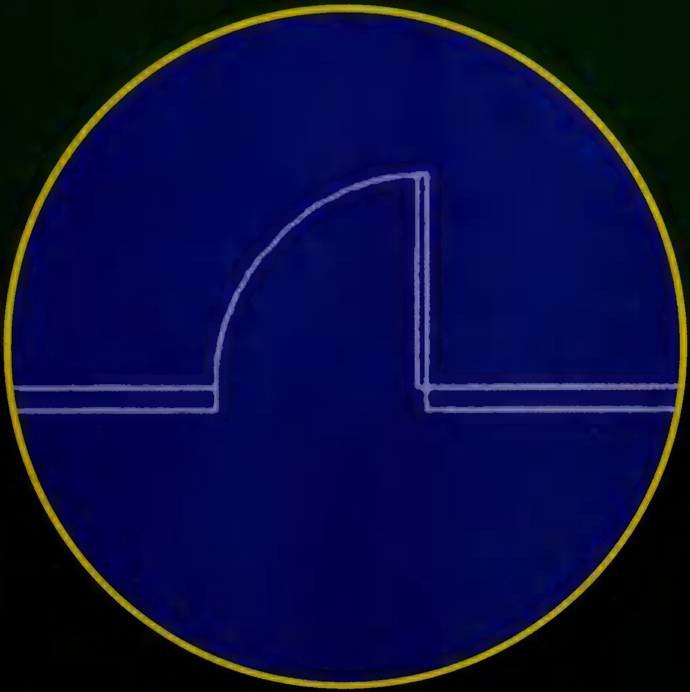

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## PRODUCTBRIEFS

### ▼ Playful laminates

Formica's latest laminate series, the Laurinda Spear collection, includes four new designs: the Rainforest Kraft, a collage of black and red shapes on craft paper; the grids and dots of Aerial Fields, which replicate a crazy quilt pattern; Millennium, which features gold and silver forms; and Ellipse Eclipse, which uses elliptical shapes and inlays. 800/FORMICA. Formica, Cincinnati.

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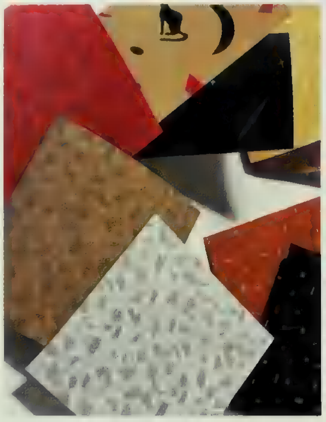
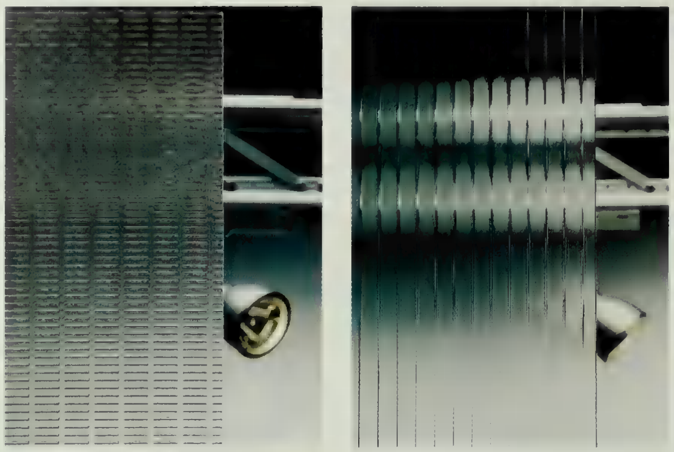




### ▲ Patterned-glass innovation

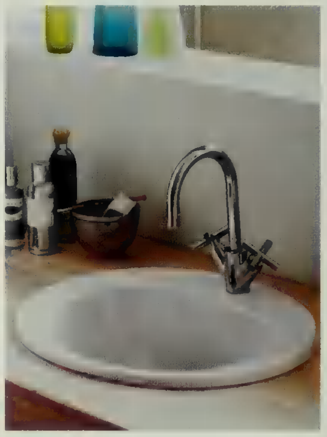
Founded in 1927, the third-generation company Bendheim Architectural Glass, a New York City–based resource center that carries more than 2,000 varieties of specialty glass, is now the exclusive United States distributor for Masterglass, precision-rolled glass developed in Europe. Masterglass is known for its geometric design patterns: squares, dots, and lines that appear in cut relief against a translucent matte background similar to sandblasted or etched glass. It can be used in both interior and exterior applications and also works well in insulated glass units. Shown here are Masterray (left) and Masterligne (right), two of the four available patterns. Not shown are Masterpoint and Mastercarre. Bendheim's future marketing plans call for a major expansion of Masterglass throughout the United States. 800/835-5304. Bendheim, New York City.

**CIRCLE 336**

### ▼ New lavatory design

TOTO USA now offers a line of lavatories designed to coordinate with their high-performance toilets—though the lavatories are color-compatible with other brands as well. The front overflow of model #LT502, shown, is concealed from view and measures 19 inches in diameter. The rounded vitreous china shape defines its elegant contouring. 800/350-8686. TOTO, Pasadena, Calif.

**CIRCLE 337**



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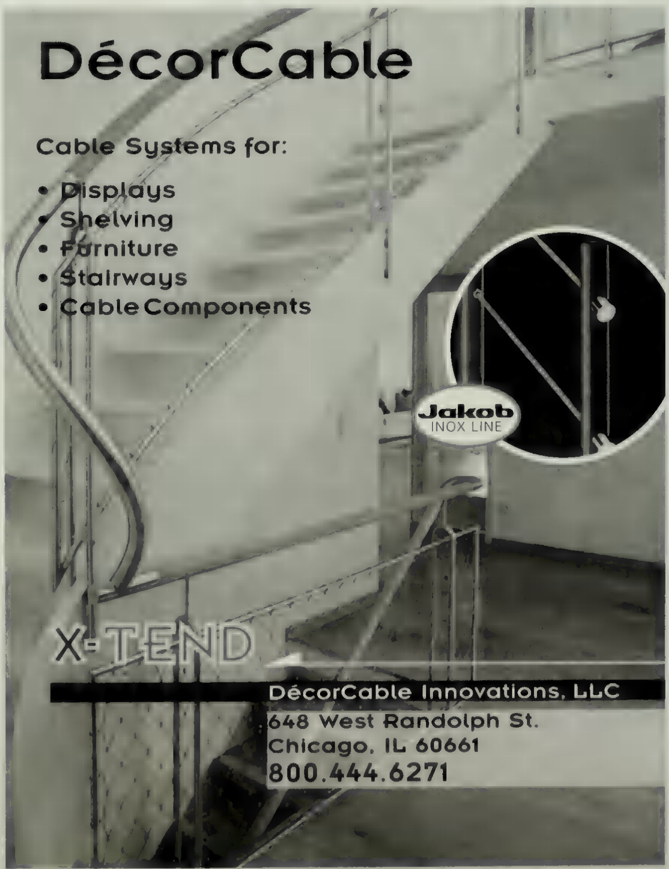

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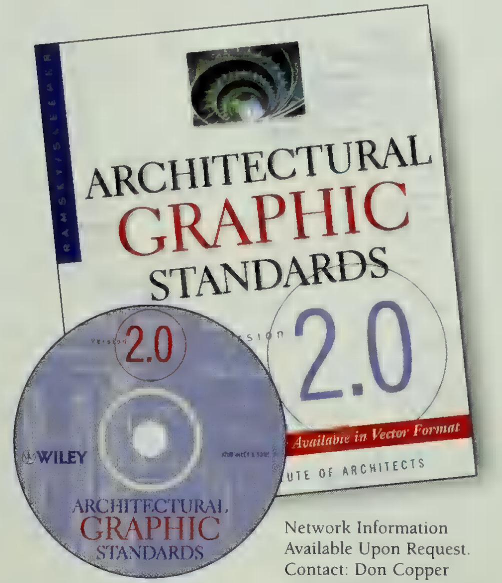

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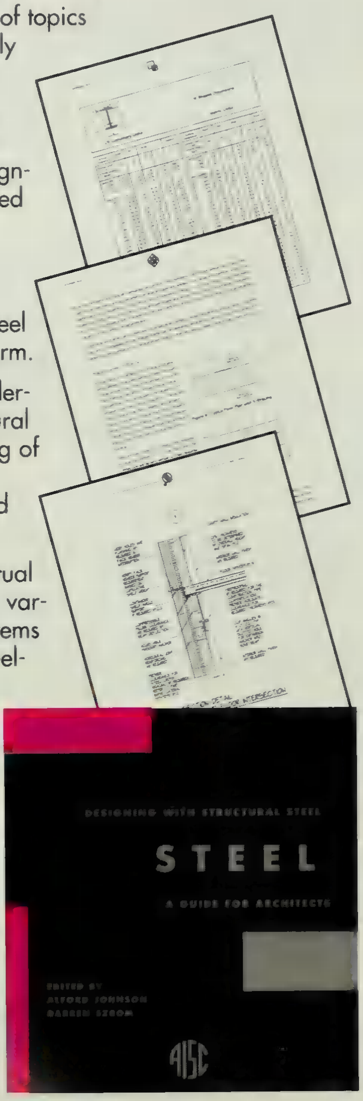

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## PRODUCT LITERATURE

### Introduction to lighting

Osram's CD-ROM, *An Introduction to Lighting*, is a tutorial on the basics. 800/LIGHTBULB. Osram Sylvania, Danvers, Mass. **CIRCLE 280**

### Light and architecture

Louis Poulsen's catalog includes old favorites, updated classics, and new products. Divided into 10 sections, the binder has information on all fixtures. 954/349-2525. Louis Poulsen, Fort Lauderdale, Fla. **CIRCLE 338**

### Styrofoam insulation

Dow Chemical's Sweet's brochure describes Styrofoam uses for commercial, roofing, geotechnical, and low-temperature applications. 800/441-4369. Dow Chemical, Midland, Mich. **CIRCLE 339**

### Lateral design guide

An introduction to the lateral load design of wood-frame buildings is available from the APA-EWA as a 20-page handbook. 253/565-6600. APA-EWA, Tacoma, Wash. **CIRCLE 340**

### Builder software on CD-ROM

A new CD-ROM outlines System Thinking for the Home and the Builder Alliance. 800/GET-PINK. Owens Corning, Toledo. **CIRCLE 341**

### Bricks that insulate

Thermo Brick is a fired-clay brick panel that yields an 8.7/RSI 1.53 R value—the equivalent of a three-foot-thick solid brick wall. The brochure outlines energy-efficiency benefits. 613/735-6849. Thermo Brick, Pembroke, Ont. **CIRCLE 342**

### Bright ideas

The 1998 calendar for the Philips Lighting Center includes information on retail and residential workshops and technology updates. The company's Retail Collection brochure provides solutions for merchandising challenges. 800/555-0050. Philips, Somerset, N.J. **CIRCLE 343**

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**Lighting courses**
Cooper Lighting's Source, an educational center, has a 1998 calendar of course schedules and descriptions. The training facility provides architects with an understanding of residential, commercial, and industrial lighting. 847/956-8400. Cooper Lighting, Elk Grove Village, Ill. CIRCLE 344

**Custom kitchens**
Dwyer's custom kitchen catalog, a 12-page, full-color brochure, showcases the company's full line of custom compact kitchens. 800/348-8508. Dwyer, Michigan City, Ind. CIRCLE 345

**Resource-efficient building**
The Guide to Resource Efficient Building Elements, from the Center for Resourceful Building Technology, includes information on foundations and block walls; framing; panel systems; sheathing and wallboard; roofing; insulation; and finishes. Center for Resourceful Building Technology, Missoula, Mont. CIRCLE 346

**Rubber/vinyl stairs and floors**
Musson safety products include fire safety, grit strip, and glow strip stair systems. Matching entry flooring products include low disc, square, diamond, fluff cord, and traffic tiles. 800/321-2381. Musson Rubber, Akron, Ohio. CIRCLE 347

**Commercial window treatments**
The Hunter Douglas commercial window treatment catalog and CD-ROM includes product design information on designs, energy efficiency, and new features. 800/933-6665. Hunter Douglas, Upper Saddle River, N.J. CIRCLE 348

**Vendor catalog service**
Information Handling Services has published a catalog of more than 15,000 manufacturers in 22 vendor groups. 800/716-3447. Information Handling Services, Englewood, Colo. CIRCLE 349

**Decking system**
A four-page brochure on the PVC vinyl Uni-Decking System from L.B. Plastics is now available. 800/752-7739. L.B. Plastics, Mooresville, N.C. CIRCLE 350

**Safety grating and stair treads**
GS Metals has a new 35-page catalog that features the company's safety grating and stair tread products. 800/851-9341. GS Metals, Pinckneyville, Ill. CIRCLE 351

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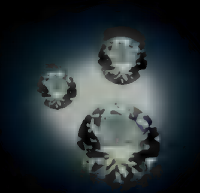
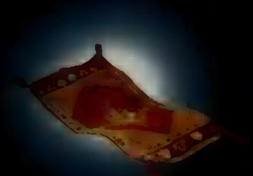


*attractive visual stimulus by varying light levels.*



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(continued from page 26)

*ARCHITECTURAL RECORD asked Andy Covington, P.E., to share some of the basic questions that new project architects should address with consulting engineers during a project's planning phase.*

A project architect who is new to his or her role and blindly relies on mechanical, electrical, and plumbing (MEP) consulting engineers is looking for a career of grief and misery. As a new project architect, you should be prepared to answer a few basic questions in order to give consultants the guidance they need to do their jobs well.

*What is the project's engineering budget?* It is all too common for architects to issue construction documents on a project only to have all bids come in over budget. Not only is this embarrassing, but it can also consume your profit. Once they know the budget, your engineers should be able to tell you what your options are based on conceptual architectural plans. It is better to find out that you will have to specify synthetic countertops instead of Italian marble as soon as possible rather than after you have shown the owner the marble samples. Otherwise, you may be forced to ask your client to choose between Italian marble and air-conditioning, which would be awkward late in the game.

The budget should be determined early and discussed often. At every design submittal, costs should be reviewed for accuracy to allow for adjustments should budgets creep over the original allocations.

*What space do you have available for MEP equipment?* One of your biggest tasks as an architect is to provide the owner with the maximum amount of usable space per unit area of construction. Based on the type of building under design and the area of the building, your engineers should be able to tell you how much space the electrical, mechanical, plumbing, and fire protection equipment will require.

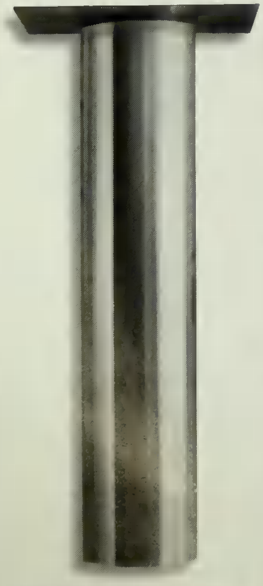
Electrical engineers do not place their large gray panels at whim. The National Electrical Code requires a certain amount of clearance around these panels for the safety of maintenance personnel, a fact that is often overlooked by younger, inexperienced architects. While the finished design may vary from initial calculations (the clearances may vary depending on the panel ratings), the engineers should be able to estimate, early in the design, how many panels will be needed and what clearances each one will require.

Most architects don't want to have to move walls late in the design process to accommodate mechanical equipment, especially after the majority of the space has been allocated to some other function. It would also be unacceptable to place plumbing vent stacks in the middle of second-story executive offices. Find out as early as possible how much space you'll need for your engineering systems up front so that you can accommodate them on the first try.

*What type of fixtures do you wish to use?* Engineers and architects tend to view the design process from different perspectives, with the engineer placing a premium on functionality rather than aesthetics. Standard fixtures that MEP engineers select include luminaires, plumbing fixtures, plumbing actuation devices (handles, buttons, and electronic sensors), and heating, ventilation, and air-conditioning diffusers. Give your engineers some guidance in selecting equipment that will enhance, not detract from, the architectural mood of each space.

When lighting is a key issue on a project, seek out the services of a lighting designer with architectural training who is capable of meeting your functional *and* your aesthetic lighting requirements. Don't expect the average electrical engineer to

*(continued on page 356)*



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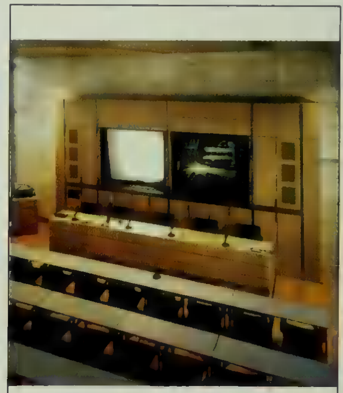

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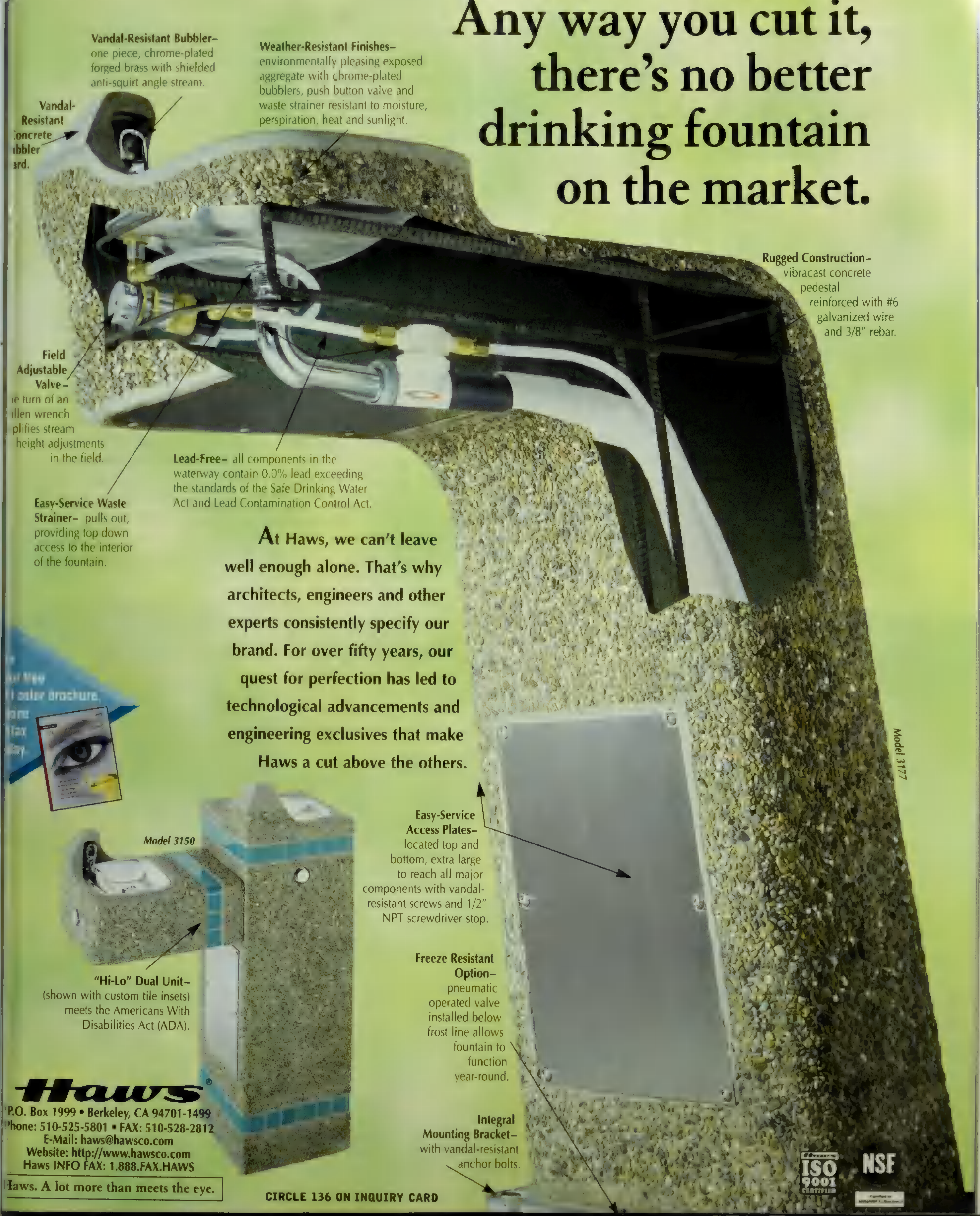

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*(continued from page 354)*

know what light fixtures will complement, say, your Romanesque design. Instead, tell the engineer how a fixture should look and point out the parts of the room you wish to accent with light. Do take advantage of the lighting engineer's expertise, however; it may lead to design innovations.

*What auxiliary systems are included in the design?* Expect to hear this question most often from your electrical engineering consultant, whose purview is, basically, lighting and power systems. Electrical engineers sometimes work with fire-alarm systems, but they are installed by their providers in many instances. Auxiliary systems that may or may not be handled by your electrical engineering consultant include security, cable television, intercom and public address, time and bell control, telephone and data, video projection, and even nurse call systems.

Most electrical consultants can design these systems if necessary, especially if the building owner wishes to have them tested before the general contractor leaves the site. However, if the systems are installed during construction, the electrical subcontractor is likely to contract with the provider-installer (and attach his own profit margin), thereby increasing costs.

*What energy sources are available? Does the owner have a preference?* As long as electricity, oil, and natural gas (or propane) are provided by different companies, there will be disagreement as to which fuel to use. Your mechanical engineering consultant should be able to provide you with figures on which is more economical in both the short term and the long term. The choice is more often dictated by owner preference than by economics. Whatever energy source you go with, it's imperative to make the decision early, as its delivery system will greatly influence a project's design.

*What special equipment will be in the building? Who will furnish it?* Building owners and engineers generally manage to plan well for the basics. However, some kinds of equipment—such as wastewater-treatment systems, special ovens or ranges, vending machines, sensitive electronic devices, and other unusual machinery—are more likely than others to be overlooked in the early phases of the design process.

It may sound obvious, but cooking equipment should be designated during the schematic phase. Coffee makers and vending machines often require water connections and always require electricity, as do refrigerators, freezers, and automatic ice makers. Automatic ice makers always require water connections.

Your engineering consultants need as much information as possible to design appropriate systems. If you can't provide the answers, point them to someone who can.

Now that you know what kinds of information your consultants will be seeking, you should be able to get the most out of preliminary project meetings. The earlier you address these issues, the quicker your engineers can provide you with contract documents that meet your expectations.

As a project architect, you are often responsible for coordinating the work of all design disciplines, and you are the individual that the owner holds responsible for the project's success. Be sure that you and your engineers are asking the right questions. ■

**Questions:** *If you have a question about your career, professional ethics, the law, or any other facet of architecture, design, and construction, please send submissions by mail to Mentors, Architectural Record, 1221 Avenue of the Americas, New York, N.Y. 10020; by fax to 212/512-4256; or by E-mail to soren_larson@mcgraw-hill.com. Submissions may be edited for space and clarity.*

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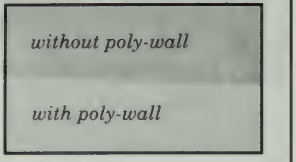

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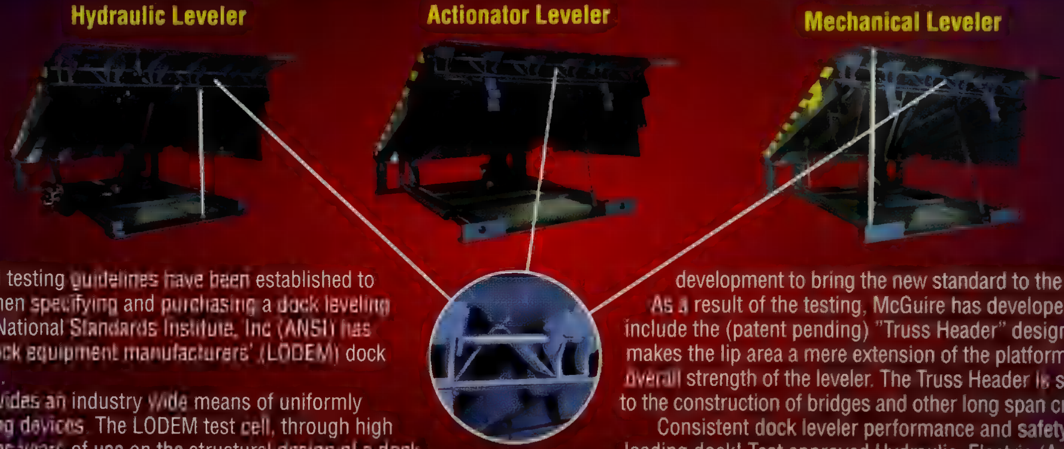
CIRCLE 139 ON INQUIRY CARD

# Does your dock leveler manufacturer meet ANSI MH30.1 LODEM specifications?



Performance and testing guidelines have been established to you confidence when specifying and purchasing a dock leveling vice. The American National Standards Institute, Inc (ANSI) has opted the loading dock equipment manufacturers' (LODEM) dock veling device standard.

The standard provides an industry wide means of uniformly mparing dock leveling devices. The LODEM test cell, through high ess testing, simulates years of use on the structural design of a dock veling device. All findings and test results are certified under the pervision of an independent, registered, professional engineer.

The W.B. McGuire Company has invested years in research and development to bring the new standard to the marketplace.

As a result of the testing, McGuire has developed levelers that now include the (patent pending) "Truss Header" design. The truss header makes the lip area a mere extension of the platform, increasing the overall strength of the leveler. The Truss Header is similar in design to the construction of bridges and other long span creations.

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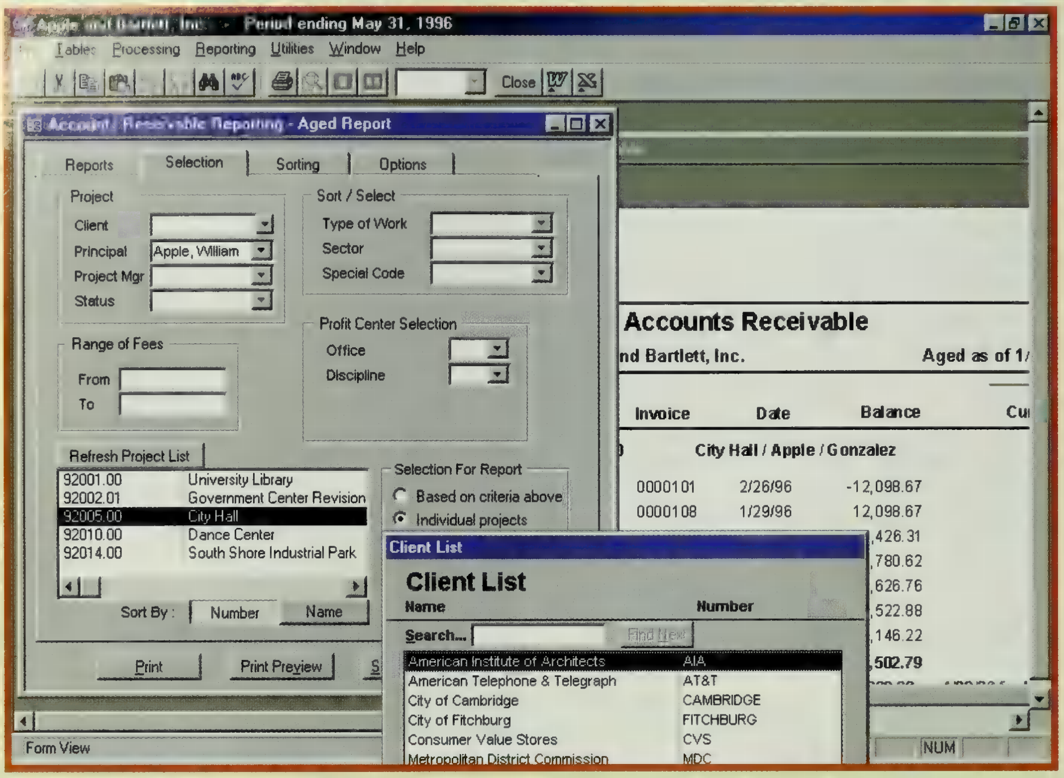

Period ending May 31, 1996

**Accounts Receivable Reporting - Aged Report**

Principal: Apple, William

Selection For Report: ○ Based on criteria above ● Individual projects

| | |
|---|---|
| 92001.00 | University Library |
| 92002.01 | Government Center Revision |
| 92005.00 | City Hall |
| 92010.00 | Dance Center |
| 92014.00 | South Shore Industrial Park |

**Accounts Receivable**

nd Bartlett, Inc. Aged as of 1/

City Hall / Apple / Gonzalez

| Invoice | Date | Balance |
|---|---|---|
| 0000101 | 2/26/96 | -12,098.67 |
| 0000108 | 1/29/96 | 12,098.67 |
| | | ,426.31 |
| | | ,780.62 |
| | | ,626.76 |
| | | ,522.88 |
| | | ,146.22 |
| | | **,502.79** |

**Client List**

| Name | Number |
|---|---|
| American Institute of Architects | AIA |
| American Telephone & Telegraph | AT&T |
| City of Cambridge | CAMBRIDGE |
| City of Fitchburg | FITCHBURG |
| Consumer Value Stores | CVS |
| Metropolitan District Commission | MDC |

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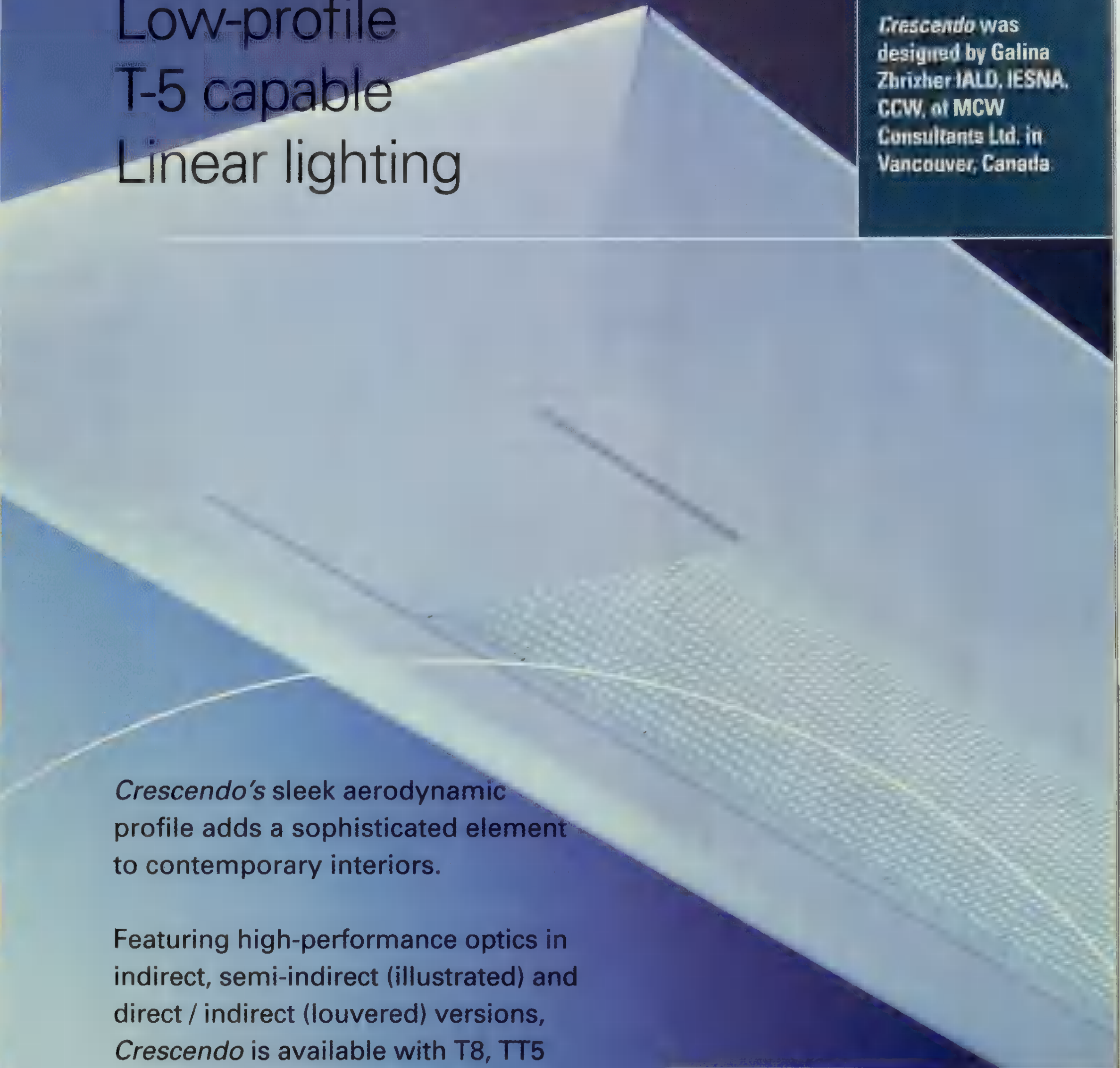
Linear lighting

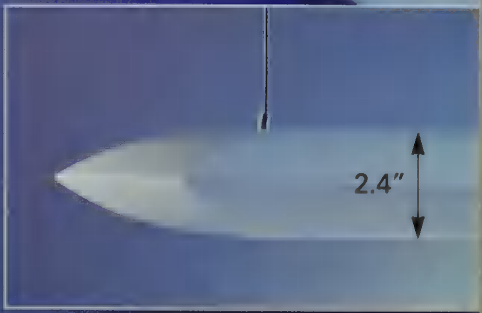
*Crescendo* was designed by Galina Zbrizher IALD, IESNA, CCW, of MCW Consultants Ltd. in Vancouver, Canada



*Crescendo's* sleek aerodynamic profile adds a sophisticated element to contemporary interiors.

Featuring high-performance optics in indirect, semi-indirect (illustrated) and direct / indirect (louvered) versions, *Crescendo* is available with T8, TT5 (biax) or the latest T5 lamp technology.

For more information, call your Ledalite representative or visit the Ledalite web site at www.ledalite.com



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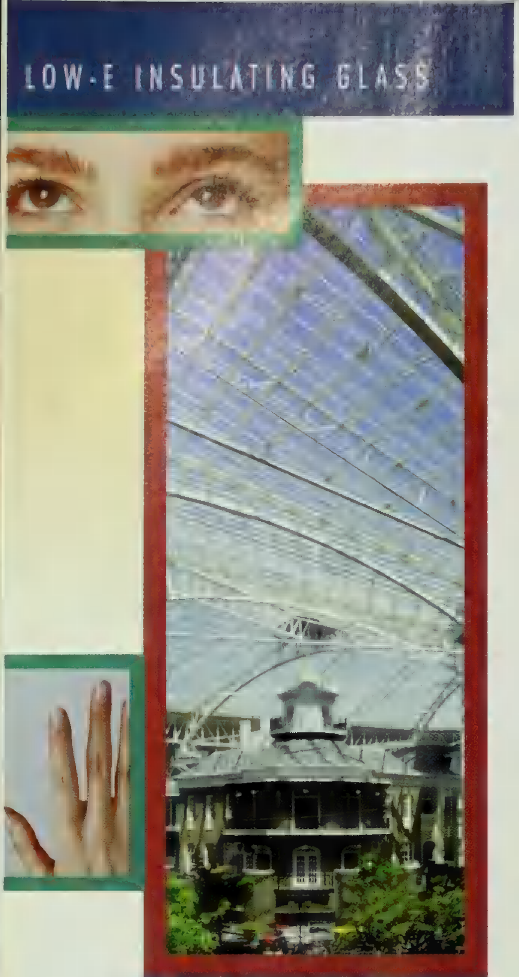

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CIRCLE 141 ON INQUIRY CARD

*(continued from page 69)*

**SAMPE Symposium and Exhibition**
**Anaheim**
*May 31–June 4*
This theme for this year's gathering of the Society for the Advancement of Material and Process Engineering is materials and process affordability. About 200 companies will have products on display. Anaheim Convention Center. 626/331-0616.

**A/E/C Systems '98**
**Chicago**
*June 2–5*
The largest information technology conference for the building professions will be held in conjunction with such expositions as Build USA, featuring building products; the EDM/PDM Expo, focusing on the management of technical and engineering documents and data; and the M/cad Expo, showcasing engineering, computer-integrated manufacturing, and mechanical-engineering applications. Tutorials and seminars will be offered. McCormick Place. For more information, call A/E/C Systems at 800/451-1196 or visit their Web site at www.aecsystems.com.

**National Housing Conference**
**Washington, D.C.**
*June 3–4*
A conference that examines cutting-edge strategies for would-be home owners; assisted housing; and achieving self-sufficiency. Also features a site tour of innovative neighborhood developments in Washington. Sphinx Club. 202/393-5772 x22.

**International Design Conference**
**Aspen, Colorado**
*June 3–6*
The 48th annual IDCA focuses on design and sports. Designers from every field will examine high-performance forms and materials; rituals and traditions; the sports landscape; rule systems; biomechanics; street fashion; and the language of sports symbols. To register, call 970/925-2257; fax 970/925-8495; or E-mail idca@csn.net. Information and updates are posted on the IDCA Web site at www.idca.org.

**Cities on the Move 2**
**Bordeaux, France**
*June 4–August 30*
This collaborative exhibition assembled by artists, architects, filmmakers, and other "creators" explores the shapes and forms of Asian cities. Musée d'Art Contemporain. Call 011/33-05-56-52-78-36 or E-mail capc@mairie-bordeaux.fr for details.

**NeoCon '98**
**Chicago**
*June 7–10*
The world's largest trade show for interiors will incorporate the Buildings Show, featuring building products and facilities management services; DECOREX, a high-end furnishings show; Office Expo/BPIA, with a full spectrum of office furnishings; *NEW* Hospitality, featuring products for restaurants, hotels, and clubs; and TechnoCon, featuring CAD solutions for interior design. Merchandise Mart. 800/ 677-6278.

**RAIC Festival of Architecture**
**Regina, Saskatchewan**
*June 10–13*
The Royal Architectural Institute of Canada's annual convention will focus on connecting architects to the communities in which they live. A trade show will take place on June 12. Delta Hotel. For information call Rory Picklyk at 306/352-2660.

**Entrepreneurship, Innovation, and Design Conference**
**Wellesley, Mass.**
*June 15–17*
A conference by and for senior corporate executives about methods for achieving success through design. Babson College. Call the Corporate Design Foundation at 617/350-7097 for details.

## Competitions

**New Public Space Competition**
*Registration deadline: May 1; submission deadline: June 1*
A design competition for a new public square on the Buffalo, New York, waterfront. For information, call Judy Camp, AIA Buffalo/Western New York, 716/852-1900, or E-mail jcamp@buffniag.org.

**AIBD and HomeStyle Design Competition**
*Registration deadline: May 5; submission deadline: June 5*
Part of this year's American Institute of Building Designers convention in July, the competition recognizes the best work of AIBD members. For information, call Bobbie Currie at the AIBD, 203/227-3640.

**San Francisco Urban Design Competition**
*Submission deadline: May 18*
A competition to develop an urban design vision for the revitalization of 24th Street, a major

*(continued on page 362)*

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CIRCLE 142 ON INQUIRY CARD

(continued from page 360)

cultural, economic, and social artery in the Mission District and the city. The goal is to create a healthy, vibrant Latino corridor that serves the local community, attracts city dwellers and tourists, and draws Latin American investments, products, and services. Write Brava, 2180 Bryant Street, San Francisco, Calif. 94110; call 415/641-7657; or fax 415/641-7684.

**Precast Concrete Design Awards**

*Submission deadline: May 22*

The Precast/Prestressed Concrete Institute offers awards for structures built substantially out of precast concrete. To be eligible, projects must have been completed in the last three years or be substantially complete at the time of entry. Entries must be located in North America to qualify. Open to all registered architects, engineers, and government agencies. Write PCI, 175 W. Jackson Boulevard, Chicago, Ill. 60604; call 312/786-0300; or fax 312/786-0353.

**AIA/Continental Europe International Design Awards**

*Submission deadline: May 22*

Awards will be given for excellence in architecture, interiors, urban design/planning, and environmental graphic design. Projects built on the European continent and completed after January 1, 1995, are eligible and may be submitted by any member of the AIA. Members of the AIA/Continental Europe Chapter may submit projects built anywhere in the world. For complete entry information, E-mail Frimmel Smith at frimmel@compuserve.com.

**Ermanno Piano Scholarship**

*Submission deadline: May 31*

Architects who graduated in 1997 are eligible to further their education by applying for this $10,000 grant, which includes a six-month internship at the Renzo Piano Building Workshop in Genoa, Italy. Call 011/39-10-61711 for application information.

(continued on page 364)

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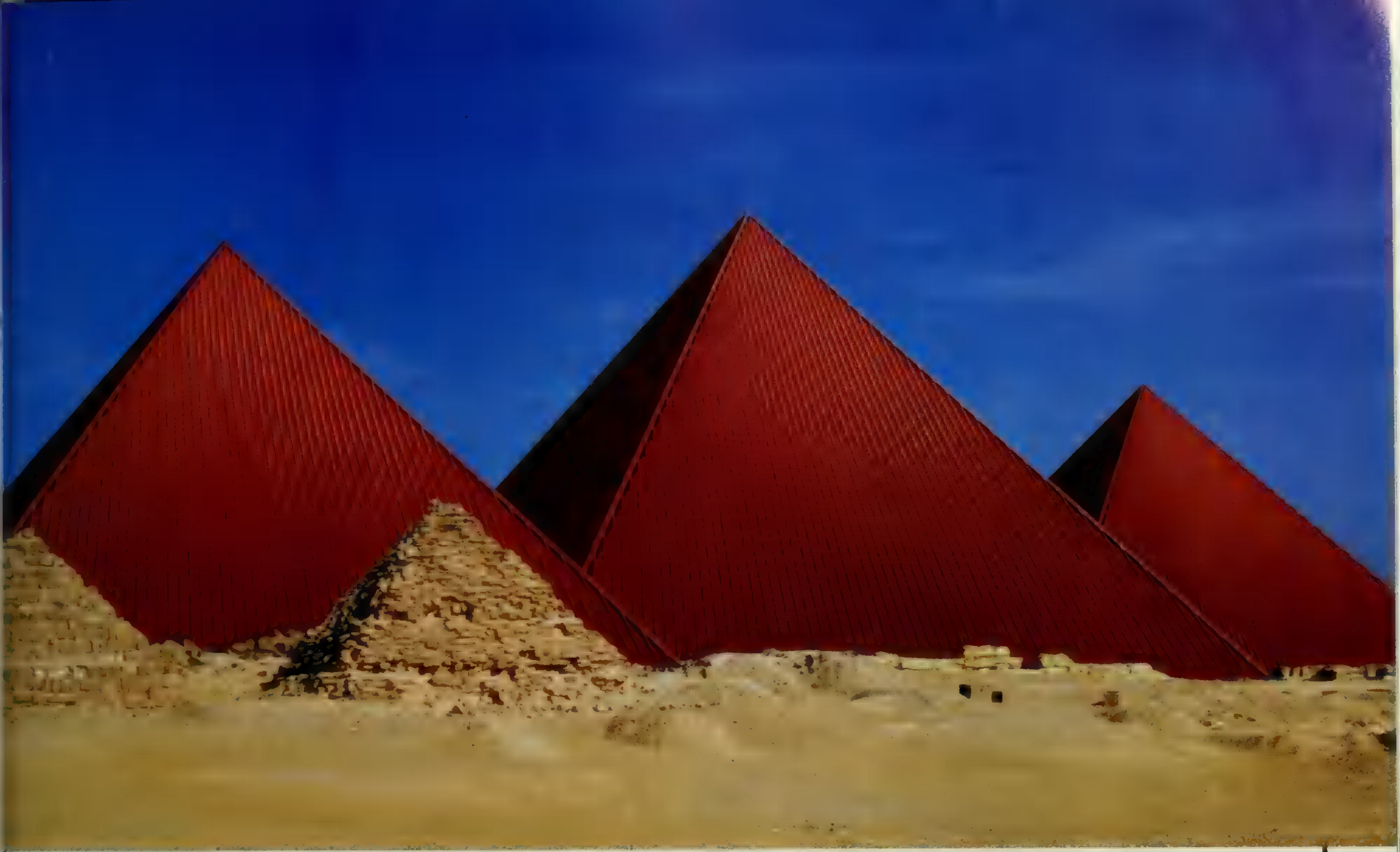

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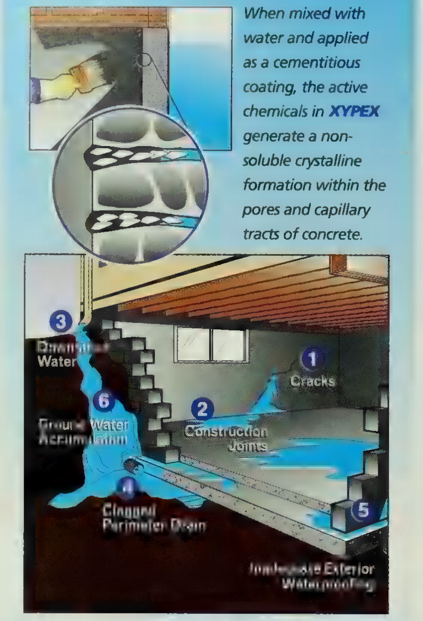

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*(continued from page 362)*

**National Art and Design Competition for Street Trees**

*Submission deadline: June 5*

Anyone, design professional or otherwise, is invited to submit a proposal to save street trees. Submissions will be accepted in three categories: Protective Measures (above- and below-ground design solutions), Communicative Concepts (signage or art), and Sidewalk Solutions (street furniture and the like). Call Caitlin Cahill at 212/642-2970 to receive a manual on street tree care, which also includes guidelines for the competition; or fax a request to 212/642-2971.

**Architecture + Energy Competition**

*Submission deadline: June 5*

The AIA has announced a call for entries for the 1988 Architecture + Energy Awards: Building Excellence in the Northwest, for the successful integration of outstanding design with energy-efficient technology. Open to completed nonresidential new construction and major renovation projects in Idaho, Montana, Oregon, and Washington. Write AIA/Portland, 315 SW Fourth Avenue, Portland, Oreg. 97204; call 503/223-8757; or E-mail aeprogram@aiaportland.com.

**Vital Signs Student Competition**

*Submission deadline: June 15*

The Vital Signs Project, administered through the University of California, Berkeley, announces its 1998 Student Case Study Competition. Undergraduate and graduate students in ACSA member schools of architecture and ABET member schools of architectural engineering in the United States, Canada, and Puerto Rico are asked to investigate, measure, evaluate, and report on the performance of existing buildings. Write Gail Brager, Vital Signs, UC Berkeley, Berkeley, Calif. 94720; E-mail vitalsigns@ced.berkeley.edu; or visit www.ced.berkeley.edu/cedr/vs/act/act_main.html.

**Urban Studies and Architecture Institute Competitions**

*Registration deadline: June 25; submission deadline: July 1*

Two idea competitions—one for the proposed redesign of a neighborhood in Verona, Italy, and one for the proposed creation of artificial islands in New York—offer $3,000 prizes and $12,000 grants. Call 212/727-2157 for details or E-mail Ldusainst@aol.com.

**Gold Key Awards for Excellence in Hospitality Design**

*Submission deadline: July 1*

Categories for submission are small and large restaurants, lobbies, guest rooms, suites, and senior living facilities. Entries must represent projects constructed or completed between January 1, 1997, and June 1, 1998. For an entry form, call Ron Zobel at 914/421-3315.

**James Marston Fitch Charitable Trust Mid-Career Grants**

*Application deadline: August 15*

Research grants of $20,000 are being awarded to professionals in the fields of historic preservation, architecture, landscape architecture, urban design, environmental planning, archaeology, architectural history, and the decorative arts. Eligible are those who have an advanced or professional degree and at least 10 years of experience. Smaller grants of up to $10,000 are also being awarded. For more information, contact Morley Bland at Beyer Blinder Belle, 212/777-7800.

**Boston Society of Architects Design Awards**

*Submission deadline: August (unbuilt awards); September (honor awards)*

The BSA's Architectural Design Honor Awards program is open to all Massachusetts architects' projects anywhere in the world and to all architects who have designed built projects in Massachusetts. The Unbuilt Architecture Design Awards are open to architects, architectural educators, and students anywhere in the world. Call BSA at 617/951-1433 x221; fax 617/951-0845; or E-mail bsarch@architects.org.

**Membrane Design Competition**

*Submission deadline: September 2*

This year's Membrane Design Competition, sponsored by Taiyokyogo Corporation, honors the creative design of airport structures using membrane. Write Membrane Design Competition, 4-8-4 Kigawa-higashi, Yodogawa-ku, Osaka 532-0012, Japan; fax 011/81-6-306-3154; or E-mail mh_001600@fc.taiyokogyo.co.jp.

**Shinkenchiku Residential Competition**

*Submission deadline: September 10*

Kyoto architect Shin Takamatsu will judge this year's idea competition, sponsored by *The Japan Architect* magazine. Winners' work will be published in the December 1998 issue of *JA*. To receive a copy of the rules, fax a request to 011/ 81-3-3811-0243.

*Please submit information for exhibitions, conferences, and competitions at least six weeks prior to the magazine's publication date (e.g., June 15 for the August issue).*

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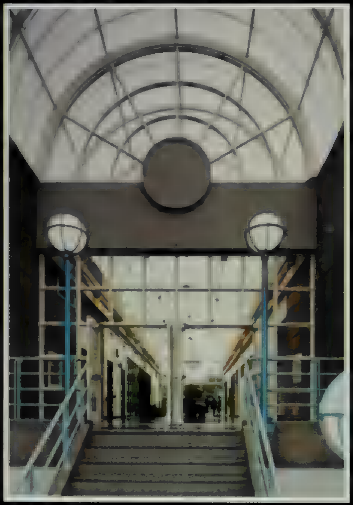

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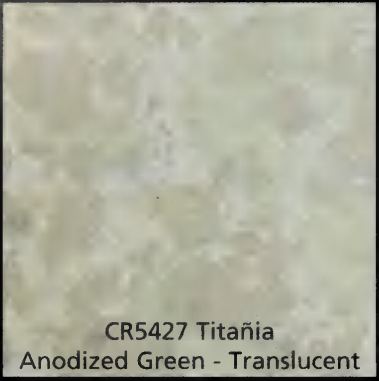
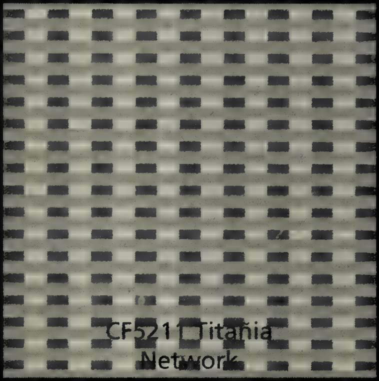
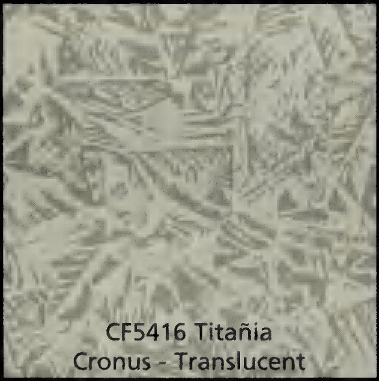


CR5427 Titañia
Anodized Green - Translucent

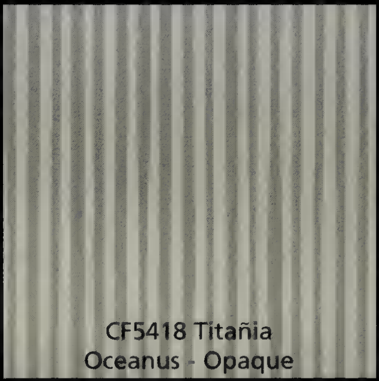


CF5211 Titañia
Network

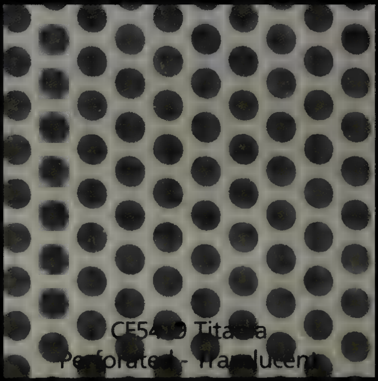
CF5414 Titañia
Lace - Opaque



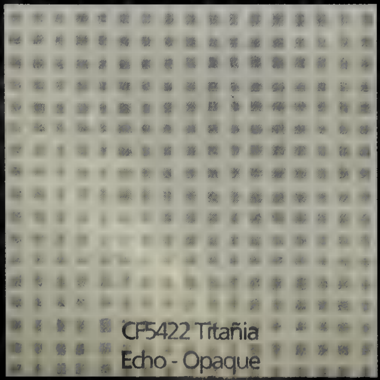
CF5416 Titañia
Cronus - Translucent



CF5418 Titañia
Oceanus - Opaque

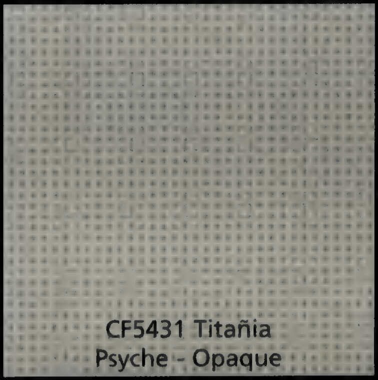


CF54[illegible] Titañia
Perforated - Translucent



CF5422 Titañia
Echo - Opaque

CF5424 Titañia
Hera - Opaque



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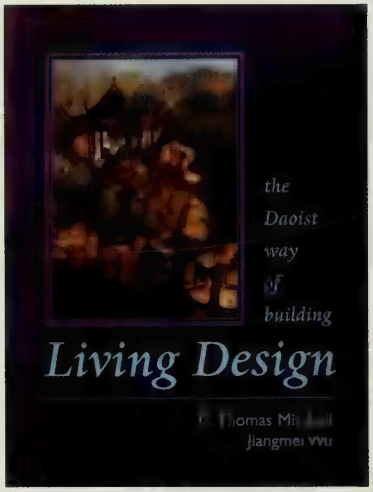

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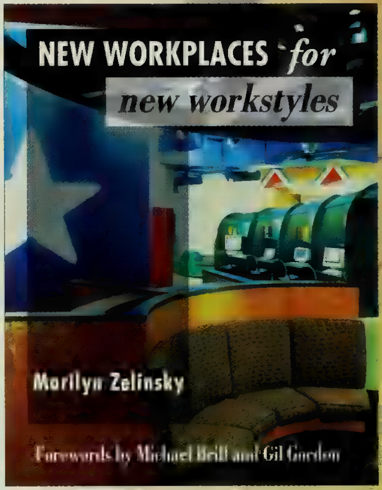
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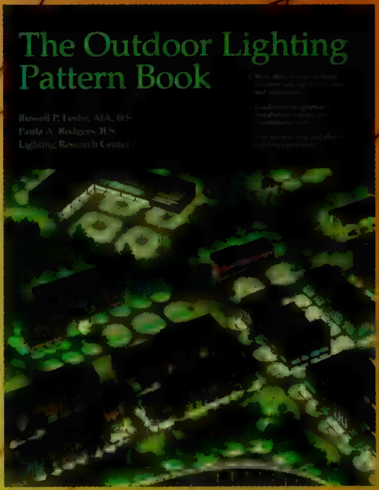
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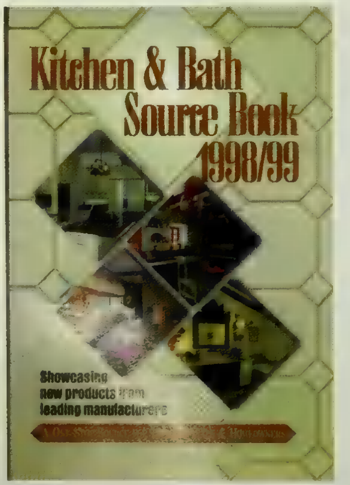
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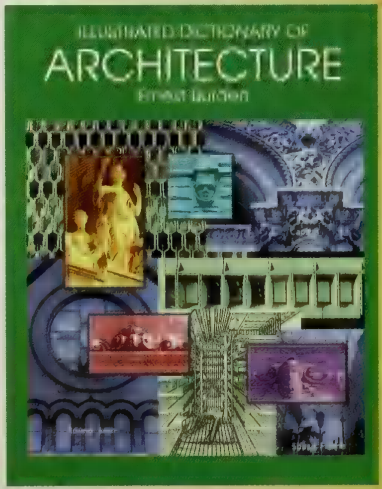

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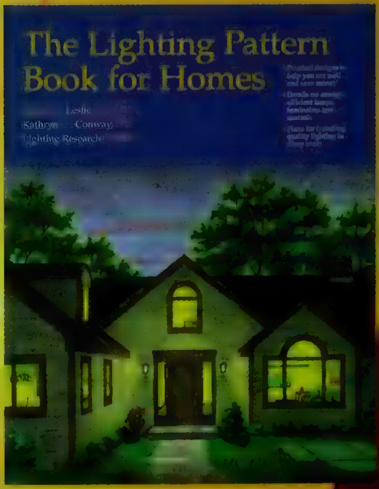

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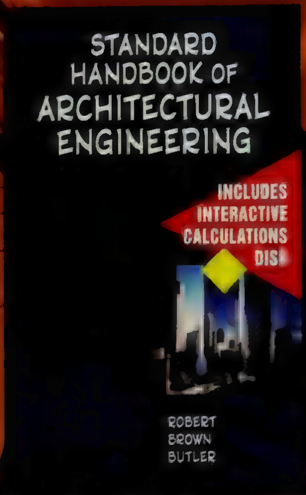
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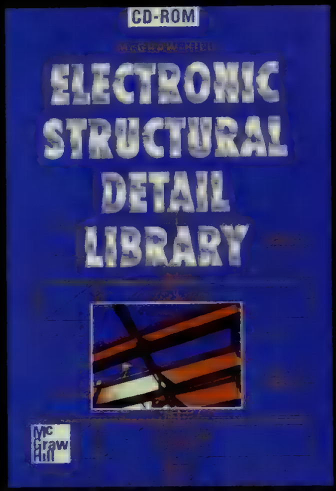

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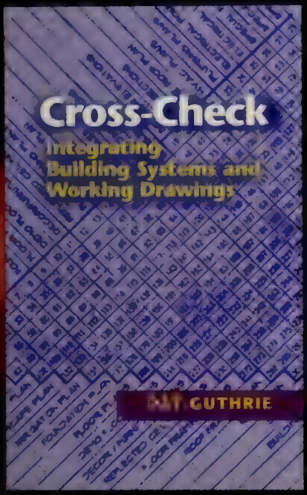

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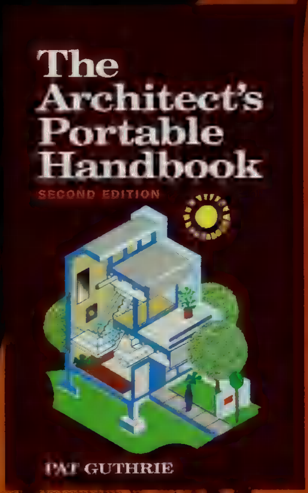

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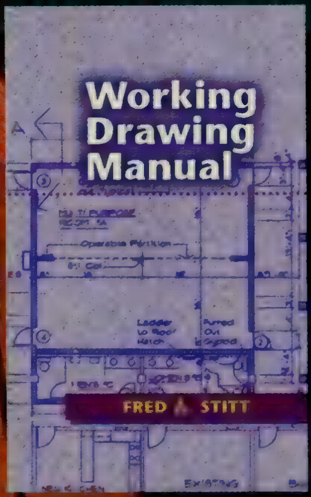

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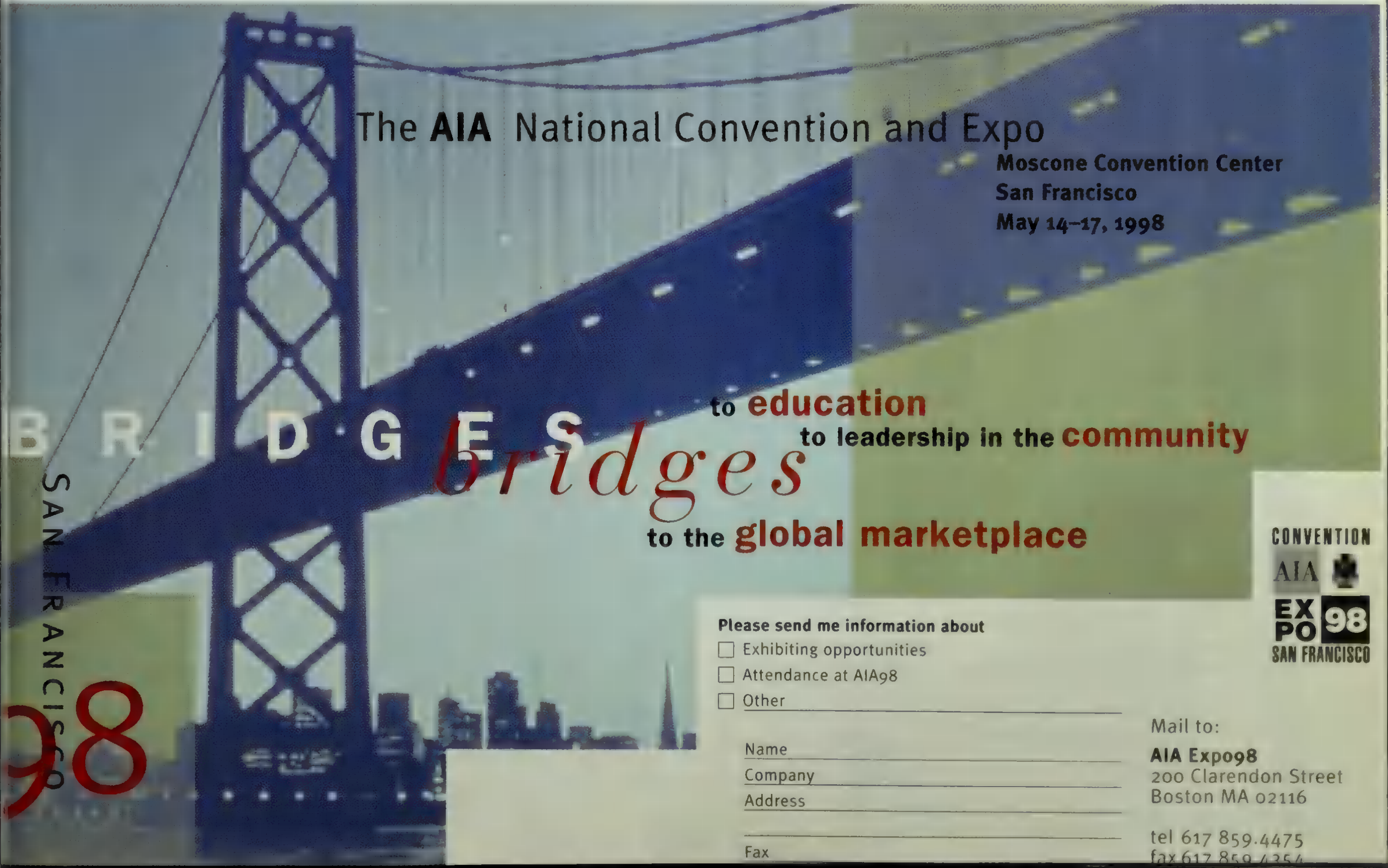
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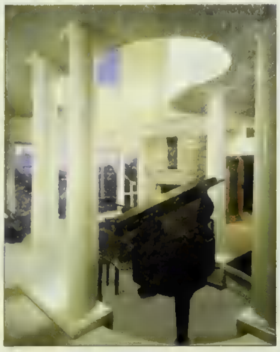

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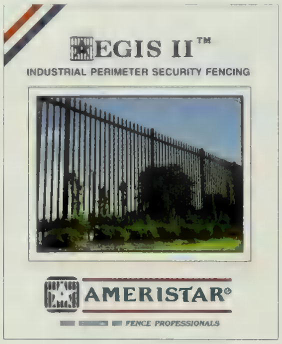

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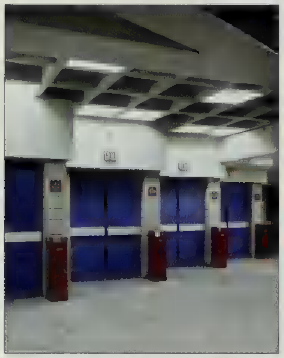


Total Door® is a fire rated door assembly that includes all hardware. Pairs do not require coordinators, vertical rods, astragals, flush bolts, or floor strikes. Will retrofit to any frame. Meets all codes and ADA. Wood and metal faces available to 3 hours. Lifetime limited warranty on locks and panics. For more information call 1-800-852-6660.

**Openings®**

CIRCLE 160 ON INQUIRY CARD

### Concrete Waterproofing by Crystallization

Applied as a slurry coating Xypex is a chemical treatment that waterproofs by penetrating the concrete with a crystalline formation that "plugs" the pores of the structure preventing water seepage. Xypex is ideal for use on the "inside" of wet underground structures.

**Xypex Chemical Co.**

CIRCLE 161 ON INQUIRY CARD

### Custom Metal Graphics

These bronze elevator door facings were manufactured by Surface Design + Technology specializing in custom & standard metal graphics. Using sheet metal finishes of a variety never offered before. There is virtually no limit to the types of patterns which can be created by combining multi-directional satin brushing, electroplating of gold, nickel, or copper. For information on custom or standard designs call (800) 537-1127.

**Surface Design**

CIRCLE 162 ON INQUIRY CARD

### Accessible Lavatory Insulation

A full color catalog will explain the different Handy-Shield safety covers offered for the new or retrofit projects that need to comply with the American Disabilities Act. The specific use, sample specifications, drawings and color choice are all summarized in this easy to understand catalog. (800) 475-8629.

**Plumberex**

CIRCLE 163 ON INQUIRY CARD

### New Fireplace Tested as a Wall Furnace

Our products have taken direct-vent technology & incorporated it into a new high performance fireplace. Model 6000 Supreme is a high efficiency fireplace (thermal efficiency up to 74%) & has an AFUE (Annual Fuel Utilization Efficiency) rating of 63%. The 6000 Supreme is standard with a variable regulator to adjust the flame & BTU input with the turn of a dial. Heat-N-Glo, 6665 West Hwy 13, Savage, MN 55378, 1-800-669-HEAT.

**Heat-N-Glo**

CIRCLE 164 ON INQUIRY CARD

### Advanced Relational Technology, Inc.

Proves that top quality architectural software can be easy to learn. Straight out of the box, Chief simplifies the process of creating full working drawings. Over 300,000 people worldwide prefer ART's architectural software with its full 3-D capabilities. Advanced Relational Technology, Inc. 3731 N. Ramsey Rd, Suite 150, Coeur d'Alene, ID 83814. T: (800) 482-4433, F: (208) 664-1316, artchief@chiefarch.com www.chiefarch.com

**ART**

CIRCLE 165 ON INQUIRY CARD

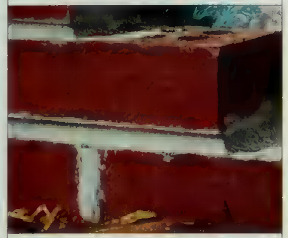
### Buckingham-Virginia Slate

has been sheltering America for over two centuries. As a roofing material, it is prized for its high mica content, natural cleft and texture, as well as its non-fading and distinctive handmade quality. Because of it's permanence and natural beauty, it was specified by Thomas Jefferson in the 1800's and remains today the roofing choice of eminent architects. Buckingham-Virginia Slate, P.O. Box 8, Arvonia, VA 23004. T: 1-800-235-8921.

**Buckingham-VA Slate**

CIRCLE 166 ON INQUIRY CARD

### Mortar Net Weep Vents



are inexpensive and easily installed in weep holes to insure masonry cavity walls breath, drain and dry quickly. Made from 100% recycled polyester with a 90% open mess in 2.5" x 4" x.5, they are available in white, tan , almond, gray, and brown. Weep Vents add to the beauty of the wall by duplicating the texture and color of mortar, thus eliminating open holes and dark shadows while restricting entry to insects. Call (800) 664-6638 for more information.

**Mortar Net**

CIRCLE 167 ON INQUIRY CARD

### Ornamental Picket Fence with a Purpose

We have given special attention to each & every component of our fence. Every item is designed for strength, durability and low maintenance. No other company builds a complete fence - rail, rivets, brackets, pickets and posts, that are stronger, more durable, have more security or lower maintenance costs than our fences. Monumental Iron Works, 6500 Eastern Ave., Baltimore, MD 21224. Tel: (410) 633-6500, Fax: (800) 239-2963.

**Monumental Iron Works**

CIRCLE 168 ON INQUIRY CARD

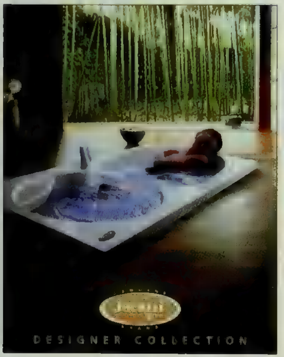
### New Invisible Products Roll Out

3 new invisible products have been added to the family of Grasspave$^2$ & Gravelpave$^2$ - Slopetame$^2$, Draincore$^2$, & Rainstore$^3$. For 16 years we have provided grass paving ring structures with 92% void area for root development. Now we're applying this technology to erosion control, drainage, & water storage with easy installation in 9 roll sizes. Call our knowledgeable staff for CADD details, specs, & product specs at (800) 233-1510. Web Site: http//:wwwinvisiblestructures.com

**Invisible Structures, Inc.**

CIRCLE 169 ON INQUIRY CARD

### Jacuzzi Whirlpool Bath



presents The 1998 International Designer Collection of whirlpool baths, faucetry and The J-Dream™ Family of shower systems. This full color catalog features beautifully styled products, integrating the most innovative luxury features. For more information please call 1-800-288-4002. (www.jacuzzi.com). Catalog free of charge.

**Jacuzzi Whirlpool Bath**

CIRCLE 170 ON INQUIRY CARD

### Celadon™ Ceramic Slate™

A kiln-fired, interlocking clay roof tile designed to look like thick slate with a breaking strength greater than 300 pounds; impervious to freeze-thaw degradation with less than 1% moisture absorption; color will not fade, flake, or effloresce—offered in slate gray, slate red, montpelier green, plumstone, and brunswick black. Sixty-year limited, transferable warranty.

**CertainTeed Corporation**

CIRCLE 171 ON INQUIRY CARD

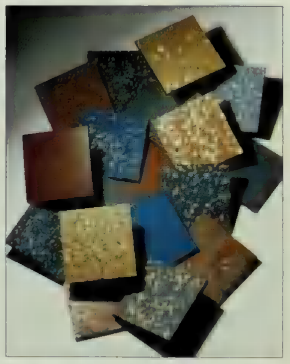
### Grand Manor Shangle®

CertainTeed's Grand Manor Shangle® is a super heavy-weight shingle built on two full-size one-piece shingles with random 8" tabs applied on top. Patented shadow lines and a unique color palette give Grand Manor the look and depth of natural slate and wood. UL Class A. Lifetime limited, transferable warranty. Algae-resistant. Meets ASTM D 3462—Tear Strength.

**CertainTeed Corporation**

CIRCLE 172 [illegible] INQUIRY CARD

### Recycled Resilient Athletic Surfacing

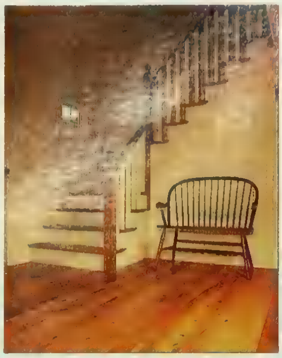


Tuflex rubber flooring is designed for commercial and sports applications. This 3/8" thick resilient flooring is excellent for weight rooms, locker rooms, hockey/ice rink off-ice areas, and golf pro shops. Tuflex exceeds OSHA and ADA standards for excellent traction. For samples, call 1-800-543-0390. Tuflex Rubber Flooring, 4521 W. Crest Avenue, Tampa, FL 33614. Phone: (800) 543-0390, Phone: (813) 870-0390, Fax: (813) 875-2312.

**Tuflex Rubber Flooring**

CIRCLE 173 ON INQUIRY CARD

### Reclaimed, Remilled. Remarkable



Vintage Lumber Co., Inc. has been manufacturing exceptional antique T&G plank flooring since 1973. Our extensive selection, consistent quality, on time delivery, and technical expertise is unequaled in the industry. For more info call 800-499-7859 or fax 301-845-6475. P.O. Box 104, Woodsboro, MD 21798

**Vintage Lumber**

CIRCLE 174 ON INQUIRY CARD

### ADA Compliant Rubber Ramps

Pemko introduces rubber ramps to complement it's line of aluminum modular ramp thresholds. Manufactured from durable, fire retardant rubber, rubber ramps accommodate offsets up to 1" high. They are weather, ozone and skid resistant and are ideal for school, hospital, convalescent home and storefront applications.

**Pemko**

CIRCLE 175 ON INQUIRY CARD

### Millions of Pushbutton Locks in Use Worldwide

ILCO UNICAN® pioneered mechanical pushbutton locks, & we continue to be the world leader in this type of security. Our locks help secure The Pentagon, US & Canadian embassies, McDonald's fast-food restaurants, plus major universities, banks, & airports around the world. We offer a wide range of models & styles to fit many applications. Most anything presently secured by a key can have the security & convenience of a pushbutton lock. (336) 725-1331.

**ILCO UNICAN®**

CIRCLE 176 ON INQUIRY CARD

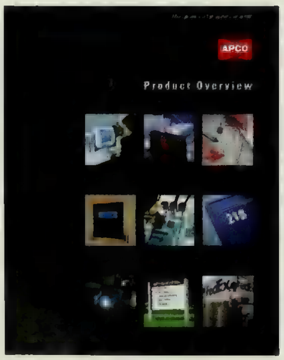
### Mini-JOMY

The JOMY Safety Ladder Co. proudly introduces the Mini-JOMY, a scaled down version of the JOMY Safety Ladder, specially designed for residential & light commercial applications. The Mini-JOMY looks like a drainpipe but folds out to a 17" wide ladder with slip resistant rungs constructed of extruded anodized aluminum & stainless steel. The Mini-JOMY is maintenance free & will last the lifetime of any building. Call 800-255-2591 for additional information.

**JOMY Safety Ladder Co.**

CIRCLE 177 ON INQUIRY CARD

### Architectural Signage



As an industry leader for 31 years, APCO understands the importance of a building's signage in creating a favorable and lasting impression. The company offers a diverse product line designed to meet architects' specific needs — from interior and exterior sign systems to displays, directories, signmaking software, and ADA compliant signs. APCO Graphics, Inc., 388 Grant Street, SE, Atlanta, GA 30312, Phone: (404) 688-9000, Fax: (800) 329-2726.

**APCO**

CIRCLE 178 ON INQUIRY CARD

### Columns & Balustrades

Classically authentic yet affordably priced columns and balustrades from Melton Classics, Inc. Quality products include architectural wood columns for paint or stain, fiberglass columns, poly/marble columns and synthetic stone columns and balustrades. Interior/Exterior, Custom Orders, Jobsite Delivery. Call 800-963-3060 for free literature or see us in Sweet's (06400Mel) or (04720Mel).

**Melton Classics, Inc.**

CIRCLE 179 ON INQUIRY CARD

### Decorative Grilles

Unusual visual effects emerge when our grilles are designed for area effects. Versatility is the theme. R&G offers architects and interior designers many ways to express the changing forms of metal with the integrity of R&G's architectural grilles. Custom or standard finishes are available plus any grille can be made in matching color to blend with your deco. 202 Norman Ave., Bklyn, NY 11222. 800-521-4895, Fax: 718-349-2611.

**Register & Grille Mfg., Co**

CIRCLE 180 ON INQUIRY CARD

### Peerless Jumbo® Mounts

Feature adjustable height, width, tilt & swivel. Mounting plate allows the fine-tuning of gravity in relation to degree of tilt, while top clamps provide stability. Constructed of heavy gauge steel with durable epoxy finish, mounts are avail. in sizes to accom. 13" - 42" screens & 125lb. - 300lb. UL listed & CSA cert. Several OSHPD apprd. VCR attachments & tamper resistant security fasteners opt.

**Peerless Industries**

CIRCLE 181 ON INQUIRY CARD

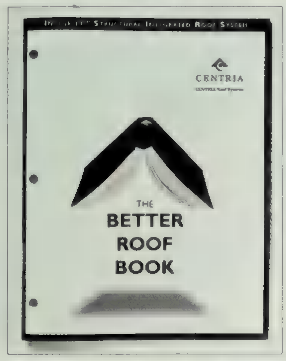
### Luxalon Wide Panel Systems

This revolutionary ceiling system offers nominal 12" (300mm) wide panels in lengths up to 19' 8" (6m) creating a clean, sophisticated, monolithic ceiling plane. Long spans are available with a soft beveled edge or a reveal edge. The system provides both acoustics and aesthetics with easily installed panels. Available in 8 finishes and 2 perforation patterns. For further information call 800-366-4327.

**Hunter Douglas**

CIRCLE 182 ON INQUIRY CARD

### CENTRIA Integrity™ Structural Integrated Roof



The "Better Roof Book" details the installation and performance of CENTRIA's Integrity™ Structural Integrated Roof System (SIRS). Integrity SIRS are composite panels that reduce costs by eliminating the need for separate decking and minimizing roof framing requirements. Rated up to R-32, Integrity consists of an exterior of G-90 galvanized steel—coated in more than 20 colors—and a finished steel interior panel with a core of high-density urethane foam core.

**CENTRIA**

CIRCLE 183 ON INQUIRY CARD

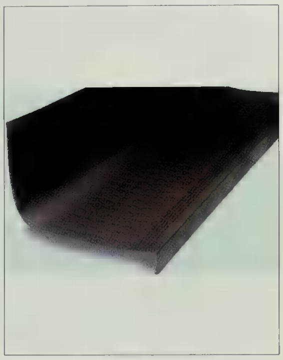
### Ultra-Clear Corrosion-Resistant Industrial Intercoms

Versatile communications for difficult, corrosive, wet, noisy sites. Unmatched simplicity of installation. Indoors/outdoors. In extreme temperatures. Industrial-strength cast aluminum cases; neoprene gaskets, seals. Heavy-duty switches tolerate extremely rough handling. Many models, including hands-free. ADCO's tech support answers questions; designs systems tailored to individual site requirements. T: 650/583-9845, F: 650/876-0111, email: adco@mcn.org.

**Atkinson Dynamics**

CIRCLE 184 ON INQUIRY CARD

### New One-Piece Stair Tread/Riser Combination



Mercer Products Company introduces its new one-piece Stair Tread/Riser Combination. This quality one-piece stair nose/stair tread/back riser is molded together as a single seamless unit and is ideal for high traffic areas and easy installation and maintenance. Available in lengths of 48" and 72" and in 12 standard Uni-Color® System colors. 800-447-8442 or www.mercerproducts.com

**Mercer Products**

CIRCLE 185 ON INQUIRY CARD

### Griffolyn® Reinforced Vapor Barriers

Under Slab
Roof Deck
Wall & Ceiling
Control Moisture Infiltration in the Building Envelope.
Griffolyn® Reinforced Vapor Barriers

Color catalog covers the system approach to vapor barriers — Griffolyn® reinforced vapor barriers — for under slab, wall and ceiling, and roof deck applications. Catalog includes product descriptions, ASTM test results and application selection guide. For information: 800/231-6074. Griffolyn reinforced vapor barriers by Reef Industries, P.O. Box 750250, Houston, TX 77275-0250.

**Reef Industries**

CIRCLE 186 ON INQUIRY CARD

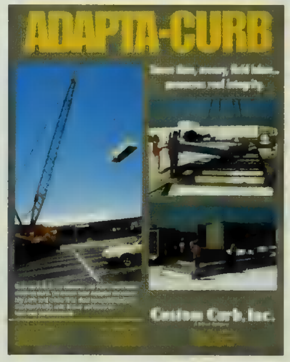
### Patène Artectura

Patène Artectura by Bomanite is a revolutionary systems approach to concrete flooring and pavements. Designed to enhance the beauty of any project, Patène Artectura melds creative techniques in coloring, patterning, texturing and finishing methods to achieve customized results. Appropriate for interior and exterior applications, new or existing concrete. Call (209) 673-2411 or visit www.bomanite.com.

**Bomanite Corporation**

CIRCLE 187 ON INQUIRY CARD

### Sloped Adapter for Retrofit Solutions



Exclusive sloped adapter is designed for positive water runoff & proper load distribution. Informative Adapta-Curb brochure details the many configurations & options available for easy addition or replacement of HVAC units, vents, plumbing stacks, skylights & other rooftop equipment without disturbing the roof or substructure. The system is a solution for retrofit or for new construction where equipment size will be determined later. 1-800-251-3001.

**Custom Curb, Inc.**

CIRCLE 188 ON INQUIRY CARD

### Parallel Design Partnership Limited

"ellen's brackets", and anodized-aluminum shelving system designed by M Ali Tayar, provides an elegant alternative to existing bracket-and-track systems. Cantilevered brackets come in two sizes, for shelves 3/4 or 3/8-in. thick and 10-in. deep. Wall-mounted tracks permit 1 1/2-in. adjustment of wood, glass or plexiglass shelves. For more info phone Parallel Design Tel: 212/989-4959 Fax: 212/989-4977.

**Parallel Design**

CIRCLE 189 ON INQUIRY CARD

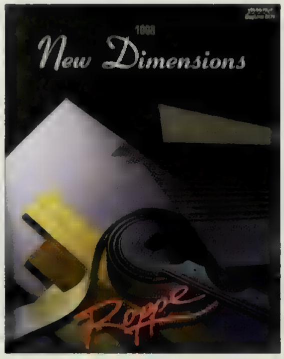
### Granite Design Award

The winner of the Marble Architectural Awards '97, Section 2 (Interior Design), is HOK with Mario Botta. The winning project, utilizing Peribonka Black granite, is the San Francisco Museum of Modern Art. The jury's comments were, "a really harmonious central reference element".

**Granicor**

CIRCLE 190 ON INQUIRY CARD

### 1998 Catalog



Roppe enters 1998 with more colors & styles of high quality flooring products. The North Coast Collection luxury vinyl tile line features Wood & Terra Naturals. Wood Naturals feature wood-look planks & tiles in many colors & styles. Terra Naturals contain a variety of marble, granite, & stone looks. Our expanded line of stair treads, including abrasive strip treads, meet current access code requirements. Offering more cove base varieties with a broad color selection. Products focus on quality & ease of installation & maintenance.

**Roppe**

CIRCLE 191 ON INQUIRY CARD

### Scania® Contract Furniture

Gressco offers a unique, non-dominating shelving system that lends a feeling of airiness, yet is inherently stable. Expose is a flexible, modular design shelving system with many accessories for the different media. As in other Scania shelving designs from Gressco, Expose offers flexibility and function well suited to public use. For literature and the name of dealer in your area call 800-345-3480 or e-mail our website www.gresscoltd.com

**SCANIA® from Gressco**

CIRCLE 192 ON INQUIRY CARD

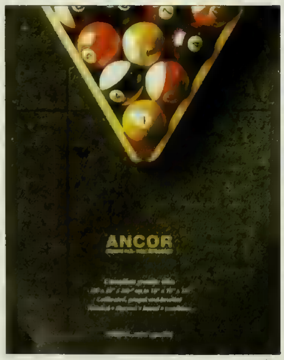
### Decorative, Thin-Film Intumescent Fireproofing

Improved spray characteristics and ratings up to 3 hours! A/D FIREFILM®II permits designers to use the appearance of exposed steel with the steel protected from fire. The product is applied as a thin-film coating 0.4 to 3.3 mm (16 to 130 mils) thick. When exposed to fire it expands to form a meringue-like insulating layer up to 4 in. thick. A/D COLORCOAT topcoat is available in a wide range of colours. Call 1-800-263-4087 or 416-263-4087. Internet: www.adfire.com

**A/D Fire Protection**

CIRCLE 193 ON INQUIRY CARD

### Ancor Granite Tile



Ancor produces over fifty No. American and Imported granites in a full range of colors and finishes for residential, commercial and institutional use. Standard format is 12 x 12 x 3/8"; other sizes up to 18 x 18 x 1/2" available. Honed finish tile is particularly suitable for high traffic commercial areas, 435 Port Royal West, Montreal, Quebec, H3L2C3, Canada. Ph# (514) 385-9366, Fax# (514) 382-3533.

**Ancor Granite**

CIRCLE 194 ON INQUIRY CARD

### Pan-Tech

manufactures composite building panels in a variety of different face materials and finishes. Aluminum: two, three and four coat Kymar finishes, anodized, colour & brushed. Stainless Steel: 304, 316 grades, #4, #8 finish, coloured stainless and patterned. Zinc: Rheinzink preweathered. Porcelain: for Spandrel applications. Copper: prepatinated.

**Pan-Tech, Inc.**

CIRCLE 195 ON INQUIRY CARD

### Hadrian Lockers for Nagano Olympics

Hadrian's open face hockey lockers, illustrated, were supplied to the Nagano Olympics. Hadrian's complete locker line includes durable hybrid epoxy powder coated standard locker systems and Athletic Lockers, all of unsurpassed quality. Both have in common single point latching, double pan box doors hung on sturdy full length continuous hinges.

**Hadrian, Inc.**

CIRCLE 196 ON INQUIRY CARD

### Teamboard The Interactive Whiteboard

Teamboard Inc., a new company by Egan Visual, has developed the industry's most powerful computer interactive whiteboard. Teamboard runs with Microsoft NetMeeting software allowing remote users to collaborate with the simplicity of a whiteboard. Share documents, print whiteboard notes in color & more. Project any computer application on the Teamboard surface & create a large area touch screen permitting you to control the projected application by touching the whiteboard. For more information 1-800-263-2387 or visit www.teamboard.com.

**Egan Visual Inc.**

CIRCLE 197 ON INQUIRY CARD

T: (800) 544-7929 F: (212) 512-2074

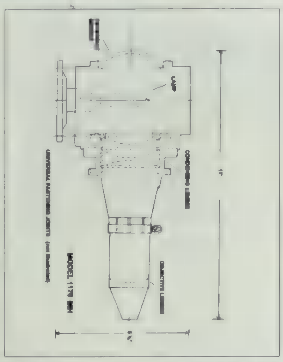
### S+P Daylighting System

S+P's Daylighting System (DS) is a result of the newest developments in plastics and building industries and provides complete architectural solutions for applications such as skylights, covered walkways, pool enclosures, solariums, atriums, greenhouses and any vertical or sloped translucent glazing. Our daylighting systems combine superior performance and design flexibility with simplicity and affordability.

**S+P Architectural**

CIRCLE 198 ON INQUIRY CARD

### Wendelighting

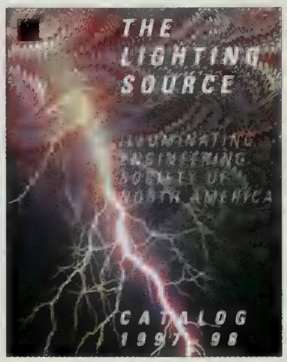


The energy efficient 1176MH 35watt metal halide projector, with a lamp life of 6-8000 hours is applicable to commercial, industrial and home uses (UL approval pending). It features (optional) our patent ed Systeme Photographique (image recording). 1-800-528-0101, e-mail Wendeltg@pa bell.net, on the web at Wendelighting.com.

**Wendelighting**

CIRCLE 199 ON INQUIRY CARD

### Illuminating Engineering Society of North America



The LIGHTING SOURCE by the IESNA offers a vast selection of standards and publications for the lighting professional. The IESNA has 10,000 members and offers many benefits. If you wish to receive a a complimentary copy of the catalog, please call Albert Suen at T: (212) 248-5000, F: (212) 248-5017, or e-mail bethbay@ aol.com.

**IESNA**

CIRCLE 200 ON INQUIRY CARD

### Nightingale® Brass 'n Color® Wall Mount Overbed Lamp

Award-winning lighting design – an attractive, economical lighting solution designed for multi-housing, healthcare & institutional applications. Handsome Brass 'n Color detail, solidly built to resist breakage. Eliminates flimsy, sagging wall lamps. Exclusive PolyLast™ Shade features delicate pleatwork, yet it's virtually indestructible. Energy-saving options. Beauty, security & stand-up durability with surprising economy. Adjustable Fixture Co., Milwaukee, WI. www//adjustablefixture.com.

**Adjustable Fixture Co.**

CIRCLE 201 [illegible] INQUIRY CARD

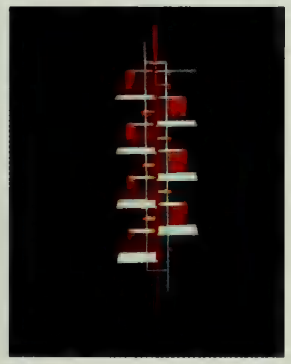
### Recessed Compact Fluorescent Downlight

"FANCY FREE", the 1997 APEX lighting award winner. The concept of this new design was to create an aesthetic, 12" square recessed compact fluorescent downlight that eliminates the harsh visual contrast between the ceiling and the fixture aperture, and offers designers numerous variations in lighted appearance. At the heart of this innovation is the design of the translucent louver cell assembly. T: (718) 456-7400 • F: (718) 456-5492 ▪ http://www.neoray.com

**Neo-Ray Products**

CIRCLE 202 ON INQUIRY CARD

### Taliesin® Pendant



Wright planned the first Taliesin Playhouse, the room required hanging fixtures that would illuminate but not be glaring. Wright denounced the bare light bulb & described it as "electric lighting without glass". When the original theater burned in 1952, Wright updated the pendant design, as reproduced by Yamagiwa USA Corp. Available in two sizes. For further info call 1.888.879.8611 (toll free). Yamagiwa USA Corp, 31340 Via Colinas, Ste 106, Westlake Village, CA 91362.

**Yamagiwa USA Corp.**

CIRCLE 203 ON INQUIRY CARD

### AR6™ and AR7™ Recessed Luminaires

Irideon, Inc. manufactures architectural lighting with automated color change, movement and beam control capability, providing a means of choreographing light in an interior or exterior space. Our new AR6™ and AR7™ recessed luminaries are completely user-configurable, offering a variety of long-life lamps and only the colors, patterns and beam options you require.

**Irideon, Inc.**

CIRCLE 204 ON INQUIRY CARD

### Lexington Aluminum Lighting Standards

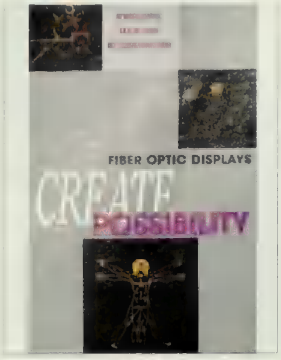
Cost-effective durable, attractive, & strong describe Lexington Standard's aluminum lighting standards. Models include round tapered/ straight /decorative, square, hinged, & embedded. The wide range of finishes & colors appeals to architects; contractors appreciate the ease of installation; distributors are attracted to the economical prices; owners enjoy [illegible] product that's virtually maintenance-free.

**Lexington Standard**

CIRCLE 205 ON INQUIRY CARD

ADVERTISEMENT

### Bright Ideas with Fiber Optics



Paint with light! Fiber optic displays are an ideal medium for use in any environment. These low maintenance displays are used for wall murals, ceilings, indoor or outdoor enhancements, hotels, museums, restaurants, retail, office and healthcare facilities. Changing colors and implied motion add to the magic.

**Fiber Optics**

CIRCLE 206 ON INQUIRY CARD

### High Performance with Uniformity and Control

Hydrel's 7100 Series Architectural Lighting System provides high performance with maximum uniformity and control. Eight standard light distributions. Standard internal glare control. Multiple mounting capabilities. Contemporary styling to complement any architectural statement. Up to 175 watts HID.

**Hydrel**

CIRCLE 207 [illegible] INQUIRY CARD

### Versatile Tripod Pendant

Versatile tripod pendant custom made in 20 different finishes and a multitude of diffusers of hand slumped glass or acrylic. Many sizes available using incandescent, halogen or PL. New: etched patterns from our standard collection of your imagination. For information, call (510) 849-1842 or fax (510) 849-2328.

**Classic Illumination Inc.**

CIRCLE 208 ON INQUIRY CARD

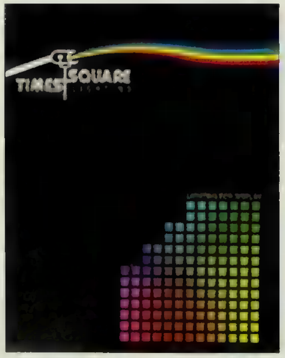
### Cast Aluminum Lighting

Sun Valley Lighting manufactures an extensive line of Standard & Custom cast aluminum lighting poles & fixtures in all period styles. Our 50 years of design & manufacturing experience provides you with unexcelled product quality. Our staff of designers, engineers, and tool makers are here to assist you. Our in-house foundry assures quality and prompt delivery at competitive costs.

**Sun Valley Lighting**

CIRCLE 209 ON INQUIRY CARD

### Lighting Fixtures

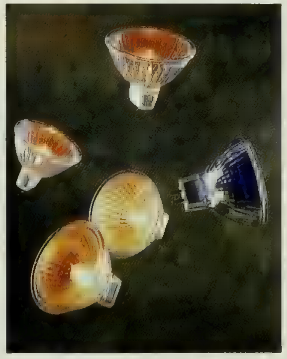


Times Square Lighting's condensed catalog contains our complete line of line and low voltage specification grade lighting fixtures. Numerous mounting options as well as accessories for our fixtures are available. Times Square Lighting, Rte. 9W, Stony Point, NY 10980, 914-947-3034.

**Times Square Lighting**

CIRCLE 210 ON INQUIRY CARD

### Ushio's Ultraline™ 10,000 hour MR-16



Ushio's Ultraline™ 10,000 hour MR-16 lamps are rated at more than twice the life of any MR-16 lamp on the market. The Ultraline™ series maintains consistent color throughout the life of the lamp & the halogen capsule protects ultraviolet sensitive objects by eliminating 90% of the harmful UV emissions. Available in medium, wide & soon to be released spot beam spreads. Ushio America is located at 10550 Camden Drive, Cypress, CA 90630. Call (800) 218-7446. www.Ushio.com

**Ushio Specialty Lighting**

CIRCLE 211 ON INQUIRY CARD

### The New Saturn

The newly expanded Saturn series offers a wide variety of contemporary and classic finishes coupled with three diffuser materials. Shown here is the SNC-277D-4DP1 which couples [illegible] Brushed Brass finish and cable hanging system with a White Acrylic diffuser. This fixture will accommodate four 26W quad fluorescent lamps. The Original Cast Lighting Inc. 6120 Delmar Blvd., St. Louis, MO 63112, 314-863-1895, fax 863-3278, www.theOCL.com.

**The Original Cast Lighting**

CIRCLE 212 ON INQUIRY CARD

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**The L.C. Doane Company**

CIRCLE 213 ON INQUIRY CARD

## POSITIONS VACANT

### ARCHITECT SUPERVISOR
### UNIVERSITY OF WISCONSIN-MADISON

The Facilities Planning and Management Division at UW-Madison is recruiting an Architect Supervisor to provide architectural services in the capital and major program areas. Starting salary up to $58,000 depending on your qualifications. Benefits offered can add as much as 30% to your total gross wages. A one-year probationary period is required.

This is a supervisory technical position responsible for facilities development of the 17,215,000 GSF (valued at $2 billion) University of Wisconsin-Madison infrastructure. Responsibilities include: planning research facilities; project programming; cost estimating; development support for the $100+ million biennial capital budget; campus representation during the design; advise the 12 Schools and Colleges, academic units and physical plant; develop policy and standards; and supervise others providing architectural services for complex projects.

Well qualified candidates will have a Bachelor's degree in Architecture and registration as a Professional Architect by the Wisconsin Examining Board OR registration in another state with reciprocal professional registration obtained in Wisconsin within six months of hire; AND at least ten years of experience in private practice or institutional set-up as an architect.

For further information on how to apply, contact Pratima Sharma (608) 262-2952, FP&M, 1217 University Avenue, Madison, WI 53706. The first review of application materials will take place on June 15. Application materials will be accepted until the needs of the department are met.

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GENERAL SERVICES ADMINISTRATION

### *Excellence in Public Architecture*

A/E Services are being solicited for a new U.S. Mission to the United Nations, 799 United Nations Plaza, New York, New York. The existing Mission will be demolished and a new building will be constructed at this location. The existing site is 9 059 square meters and the estimated range of costs for demolition is between 3 and 4 million dollars. General Services Administration desires this facility be constructed on this site, within the context of the existing community. It should reflect an appropriate expression of the American architectural tradition; while being visual testimony to the dignity, enterprise, vigor and stability of the United States of America. The proposed United States Mission will contain an occupiable area of 9 986 square meters and a gross area of 13 128 square meters. The estimated cost of construction for this facility ranges between 38 and 41 million dollars. A two-stage selection process will be used for the selection of a Design Team.

***Stage I: Initial Selection***

*Submission of Designers Portfolio.*
Submissions will be evaluated on their design merits. The designers will provide evidence of their capabilities to deliver design excellence and express their design philosophy. The submission will be evaluated and short-listed in this stage by the following criteria:

- Past Performance
- Philosophy of Design Intent
- Lead Designers Architectural Profiles

***Stage II: Final Selection***

*Submission of the Design Teams Qualifications.*
The short-listed design firms from *Stage I* will submit their A/E team qualifications for review. The teams are to include designated lead designers and all consultants who will work on the project. The A/E design firms will submit Standard Forms 254 and 255's which reflect the entire team. GSA will establish the criteria and the date these submittals are due and provide the selection criteria for the interviews and final selection process at the time of the *Stage I* short-list announcement published in the Commerce Business Daily.

*Qualifications:* Details of this solicitation have been defined in the Commerce Business Daily advertisement which appeared on March 31, 1998 @ http://cbdnet.access.gpo.gov. Designer Profiles for *Stage I* are due June 9, 1998.

*Limitations:* The Principal designer's office must be located within a seventy-five (75) mile radial distance from Columbus Circle, New York City.

*Details of this solicitation may be obtained through:*

Ms. Gayle Schuster, Contract Specialist
212-264-2825

### CLINICAL PROGRAM PLANNING ASSOCIATE

The New York Hospital Medical Center of Queens has an exciting opportunity for an experienced healthcare planner. Reporting to the Vice President for Planning, you will assist in program planning and development, strategic marketing, data collection and analysis, and the implementation of research based business plans for two distinct healthcare facilities.

The successful candidate will have a minimum of 3 years experience in healthcare planning; clinical background preferred. Bachelors degree, excellent analytical skills, computer competence and the ability to work in a fast-paced environment required. Spreadsheets and database experience needed. Must be flexible with regard to schedules in order to meet goals and objectives.

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## POSITIONS VACANT

### DIRECTOR OF PROGRAM MANAGEMENT

Qualifications: Bachelor's degree in architecture, engineering or related field required (advanced degree preferred). Ten (10) or more years of successful management experience in the combined areas of facility planning, facility design, and construction management for large-scale institutional/commercial (non-residential) projects. Firsthand knowledge of federal, state and local codes and regulations governing the planning and design of public facilities as well as working knowledge of contract law. Experience in project scope control, project budget control, project schedule control and development and maintenance of effective computerized project management information systems. Performance Responsibilities: Directs departmental activities including the development of policies and procedures in compliance with School Board policies, Florida Statutes, Florida Department of Education Rules and sound business practices. Oversees the translation of all educational facility specifications into implemented projects and evaluates construction delivery systems for appropriate use. Salary Range: $56,253 - $82,550. To Apply: Send a detailed letter of interest, resume (Include Social Security number) and three (3) letters of reference from current or former supervisors by 5/29/98 to: School District of Palm Beach County, Glenda Hoffmeyer, Employment & Placement Services, 3364 Forest Hill Boulevard, A-115, West Palm Beach, FL 33406. AA/VP/EOE. www.palmbeach.k12.fl.us

## POSITIONS VACANT

### A great team is the best foundation to build on.

The Woolworth Corporation is a diversified global retailer that operates Foot Locker, Lady Foot Locker, Kids Foot Locker, Champs, San Francisco Music Box, Northern Group, After Thoughts, Kinney, Colorado and Footquarters. As a professional, you know how important it is to have a solid foundation. In order to keep pace with the success and expansion of our leading retail organizations, we need talented, highly energetic professionals to design and build all of our future locations.

**Contract Administrator**
Working with paralegals, you will manage, edit and up-grade contracts. Requires 2-5 years of related experience, prior expertise purchasing bulk materials, and knowledge/understanding of contracts. Must be very good with numbers and have excellent financial ability.

**Purchasing Manager**
You will be responsible for purchasing "owner furnished" items. The ideal candidate must have 3-5 years of related experience; excellent negotiating skills, especially freight negotiation, and a strong financial background.

**Manager of Construction**
You will supervise and manage all Construction Managers and projects. Duties will include daily contact with contractors and analysis of details and blueprints. This position requires heavy travel (3-5 days/week, 5-6 months/year). The ideal candidate will be extremely energetic and have 5-7 years of related industry experience.

**Store Planning Manager**
Manage store planning process, plan layout of stores, edit, proof and distribute final blueprints to contractors. Prior experience or degree in related field is acceptable; familiarity with AUTOCAD is a plus. Daily interaction with outside architects is required.

**Manager of Design**
You will manage the store planners, CAD operators and design concept issues; negotiate changes in materials as a result of cost changes (i.e. same look, lower price) and create design package drawings. 5-7 years of experience is required; familiarity with AUTOCAD a plus.

**Construction Manager**
Manage all projects pertaining to 20-30 designated stores at a time; coordinate with contractors; and visualize all details. This position requires heavy travel (3-5 days/week, 5-6 months/year). The ideal candidate will be extremely energetic and have 5-7 years of related industry experience.

***All positions require related degree or trade school certificate; retail/manufacturing experience preferred.***

Please mail or fax your resume (*only resumes with salary requirements will be considered*), to: **Woolworth Corporation, Employment Manager, 233 Broadway, New York, NY 10279; FAX: (212) 720-4031.** An Equal Opportunity Employer M/F/D/V.

WOOLWORTH CORPORATION

## POSITIONS VACANT

### ENGINEER

Acoustical Engineer needed for Rockville, MD acoustical consulting, technical dsgn & contracting co. Must have 2 yr exp researching, dvlpg & dsgng specialized acoustics for comm'l & industrial projects; using acoustical test equip: Sound Intensity Analyser, Time Delay Spectrometer & FFT Analyser. MS-Acoustics Engg. Respond to: HR Dept, Electro Media Designs, 1010 Rockville Pike, Rockville, MD 20852.

### CORPORATE EXECUTIVE PROJECT OFFICER

Internationally recognized European real estate developer based in Prague, CZ needs a renaissance trained architect with European and/or other international qualifications. Registration is not necessary. The candidate will work directly for the CEO of the company, an American and British architect. The professional will also work along side a British construction surveyor, American architect, and Czech engineers. All work completed to date has been of an international rehabilitation award quality and we plan on continuing this philosophy. You must be sensitive to historical buildings, local cultures, local design professionals, have some deluxe hotel and residential experience. Also helpful will be small office building, and urban planning background. As a corporate architect you will help select the design team and monitor production and contracts, the same for contractors, and all governmental and banking compliance requirements. You must be willing to relocate for a minimum of 30 months to Prague with European travel on a weekly basis. Salary package commensurate with experience and qualifications. We have a quality U.S. medical plan as part of your remuneration. Send preliminary interest by fax to Amira Shehatová, assistant to the CEO, at 011.420.2.268.165; include resume with specific notations on hotel and residential work, job descriptions, contract and supervision history, and basic financial requirements.

### ARCHITECT/COMPUTER ARTIST

Architect/Computer Artist for Architectural firm in Toledo, Ohio: Will use AutoCAD, Microstation version 5, and 3D Studio software to prepare computerized 3D modeling and rendering of various architectural plans using knowledge of architectural design material and structural analysis. Will prepare 2 point and 3 point perspectives and isometric renderings for presentation to clients using mentioned software by determining written documentation and architectural plans. Will contact clients in Taiwan, Hong Kong, and mainland China to obtain localized architectural design modification specifications and prepare appropriate 3D computer modeling. Will review technical documents prepared in Chinese language for purposes of producing such models and renderings and will paint said renderings. Requires a Bachelor's degree in Architecture. Also requires six months experience in the job to be performed. Must speak Mandarin dialect of the Chinese language as well as read and write Chinese. Hours: 9:00 a.m. - 5:00 p.m. 40 hours per week at $31,160 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send two copies of resume and cover letter to: ES Sp Prgms, REF # 2435D, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, OH 43216 - AN EMPLOYER PAID AD. NO CALLS.

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Project Managers, $55-100K; Ass't Project Managers to $50K; Sales Associates $$$; Sales Assistants $35-45K; AutoCAD Specifiers, $35-50K; Trainees, $28-32K. NYC, NJ, Long Island. For details call Frank Cassisa at 212-233-2900 or fax resumes 212-233-3043. American Personnel, 170 B'way, NY, NY 10038.

### OPPORTUNITIES NATIONWIDE

Gaines International is a specialized retained professional search firm exclusive to the design and building industries. We have been established for over 17 years and service a national client base. We are currently in search of candidates for various middle to upper level design and management positions. The markets serviced by our clients include corporate/commercial, retail/entertainment, hospitality, institutional, government, and healthcare. All materials kept in complete confidentiality. All fees paid for by client firm. Come by and visit us at the AIA Convention Booth #715. Please mail/fax/email resumes to: Gaines International, Attn: AR Research, 650 N. Dearborn, Ste. 450. Fax 312/654-2903, E-mail: ssg@gainesintl.com; http://www.gainesintl.com.

## FACULTY POSITIONS VACANT

### TENURE-TRACK POSITION AND DIRECTOR OF THE HOUSING FUTURES INSTITUTE
### BALL STATE UNIVERSITY
### MUNCIE, INDIANA

The Department of Architecture is seeking an outstanding educator to serve as Director of the Housing Futures Institute in a tenure-track position available August 21, 1998. Rank and salary dependent on qualifications. The Housing Futures Institute (HFI) was created in the Department of Architecture in 1990 as a research center for housing design and technologies. It is supported by a combination of university base budget and external research grants. The Department is part of the College of Architecture and Planning, which offers the opportunity and facilities for interdisciplinary research projects. Under the late director, Stan Mendelsohn, HFI had been able to attract nearly $1.5 million in research funding. Current research involves faculty from Architecture, Planning, Landscape Architecture, Applied Science, as well as the university's Center for Energy Research, Education, and Service. The Director will serve as a full faculty member in the Department of Architecture with responsibility to teach courses at the graduate or undergraduate level and to serve as the HFI principal researcher. These duties include writing proposals and obtaining funding at the appropriate level. The position is funded in the base budget of the Department of Architecture. The extent of teaching responsibilities will depend on the research activity but include teaching architectural design studio, allied courses in building science, and/or social sciences and research methodology. Minimum qualification: master's degree in architecture or equivalent area by date of appointment. Preferred qualifications: architectural or engineering registration, evidence of scholarly research in housing, record of obtaining funding to support research, experience in teaching and/or professional practice in the area of specialization, and professional contributions. Send letter of application, curriculum vitae, three letters of reference, official transcript of highest degree earned, samples of research work, student work and/or personal work, and any evidence of teaching and research ability to: Search Committee Chair, Department of Architecture, Ball State University, Muncie, IN 47306. Nominations are welcome. Review of applications will begin immediately and will continue until the position is filled. (BSU Web site: www.bsu.edu) Ball State University is an equal opportunity, affirmative action employer and is strongly and actively committed to diversity within its community.

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• Sports Complex • Village Retail • Special Events • Dining • Tour Boats • Entertainment • Marinas

Campgrounds • Food Service • Lake Ferry • Tour Boat • Special Events • Nature Tours • Equestrian Center • Sports Complex • Demonstration Farm

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- *Lodging Complexes*
- *Recreation Rentals*
- *Food Service*
- *Lake Ferry/ Tour Boat*
- *Demonstration Farm/Farm Store*
- *Equestrian Center*
- *Sports Complex*
- *Special Events*
- *Nature Tours*
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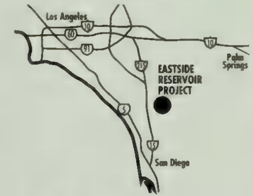
- *80-mile Trail System*



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Metropolitan is committed to making the new lake and the surrounding 10,000 acres of dramatic unspoiled Riverside County hill country the setting for an unparalleled 1,900 acre recreation complex. A marriage of urban scale uses such as water parks and golf complexes with classic outdoor activities such as camping, boating, and fishing, the recreation complex will be ready to go, with all environmental and development entitlements in hand by mid-1998.

Be part of the largest water recreation opportunity since MWD tapped the Colorado River and made Southern California bloom in the 1930s.

*To receive a packet on recreation business opportunities at the Eastside Reservoir Project, or for other information, contact Fran Steele at 350 S. Grand Ave., Rm. 8-073, Los Angeles, CA 90071. Phone (213) 217-7937, Fax (213) 217-7198, or visit our website at www.mwd.dst.ca.us.*

**Did you know...**

that you can receive continuing education credits by reading

**ARCHITECTURAL RECORD**

***See the table of contents for details.***

# AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

## INSTRUCTIONS

- Read the article "Evaluating Hidden Site Conditions" (page 247) using the learning objectives provided to focus your study.
- Complete the questions below, then check your answers (page 392).
- Fill out the self-report form (page 392) and submit it to receive two AIA Learning Units.

### Questions

**1.** List four hidden site conditions that can have a significant impact on a building project and the best way to gain information about what might exist at a particular site.

**2.** When a hidden site condition reveals itself, who is responsible for the necessary analysis and any changes to the project?

**3.** Explain what an ASTM phase-one analysis of a brownfield site consists of and describe what should be done if contamination is uncovered.

**4.** Describe what can be seen on a site's surface that may indicate archaeological finds and what special precautions must be taken if human remains are found.

**5.** Describe what steps need to be undertaken if a project is funded by a federal agency or if the site is listed on the National Register of Historic Places.

**6.** List some easy ways to learn whether endangered species are present.

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CIRCLE 151 ON INQUIRY CARD

## AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

### ANSWERS

Questions appear on page 390. To receive CES credits, fill in the self-report form below.

**1.** Building projects can be affected by hidden site conditions including wetlands, archaeological finds, toxic waste, and endangered species (including vegetation). What is discovered often depends on where the building is located. For example, brownfields may be found in any post-industrial city, particularly in the Northeast. Coastal or watershed areas signal wetlands. In the Southwest, Native American relics are common, though they exist in other parts of the country as well. The best way to tell what is hidden on the site is to conduct a site analysis.

**2.** The individuals who are held responsible if a hidden site condition arises vary, depending on who conducted the site analysis, who paid for it, and how the condition was handled. Architects are being pulled into the debate as to who is responsible more frequently. However, they can often be relied on to provide innovative site solutions. Cross-disciplinary teams, including bankers, lawyers, environmentalists, engineers, and architects, work together to salvage sites with hidden problems.

**3.** An ASTM phase-one site assessment consists of an evaluation of the site's history (through a search of relevant literature) and a sampling of the soil, groundwater, and site structures. If contamination is uncovered at this point, it is less expensive than if it is discovered once construction begins. When contamination is found on a construction site, stop work immediately, notify the client, and call regulatory authorities or an environmental consultant. Exposing employees to contamination can be dangerous, so advise them to stay away from the site until the condition is remedied.

**4.** If you look carefully on the surface you can find evidence of what's underground. On land once used by Native Americans, look for arrowhead pieces, bits of pigment that could be pottery, and small swells that could be burial mounds. If human remains are found during construction, stop work and call the coroner, an archaeological firm, or the local university's department of anthropology.

**5.** Under section 106 of the National Historic Preservation Act, the property must undergo at least a phase-one archaeological analysis, which involves the digging of test pits. If something valuable is found, a phase-two dig follows. Phase three is a full-blown excavation.

**6.** Check with the United States Fish and Wildlife Service to see if there are endangered species in the region. On private land, contact local officials for building restrictions. If you need help, contact a local environmental consultant, the regional department of environmental conservation, or the Fish and Wildlife Service.

## AIA/CES SELF-REPORT FORM

*(Use to report learning units earned for Architectural Record only.)*

**Member information:**

**Last Name** **First Name** **Middle Initial or Name**

**AIA ID Number**

**Program/project title: Architectural Record (05.98)**

*Check the following as applicable:*

☐ "Evaluating Hidden Site Conditions" (page 247)
☐ "Specifying Wood Windows, Skylights, and Doors: Beyond Aesthetics" (page 221)
Section sponsored by the National Wood Window and Door Association

*Completion date (M/D/Y):* _______ / _______ / _______

**Quality Level (QL) of this program:** Each article or sponsored section will earn you a total of 2 LUs at Quality Level 2. Fill in: ____ total LUs.

**Quality Level of each article is 2. Completing both sections earns a total of 4. Material resources used:** Journal article or sponsored section. This program addresses issues concerning the health, safety, or welfare of the public.

**I hereby certify that the above information is true and accurate to the best of my knowledge and that I have compiled with the AIA Continuing Education Guidelines for the reported period.**

**Signature** **Date**

Send completed form to University of Oklahoma, Continuing Education, AIA/CES, Room B-4, 1700 Asp Avenue, Norman, OK 73072-6400. Fax 405/325-6965. For additional information, call 800/605-8229.

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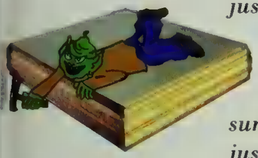

*“Heck, this stainless steel plywood core has seven layers. I just can’t penetrate it. Look, all my efforts can’t scratch the surface and graffiti just rubs right off. Taking down the building was easier than this!”*

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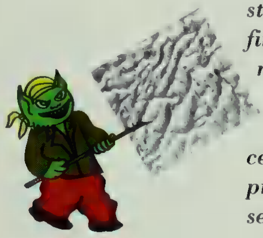

*“This leather grain stainless steel finish is repelling my strokes of genius. Darn, it’s been formed and cemented under pressure and secured with steel reinforcements. I’m outta here!”*

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CIRCLE 152 ON INQUIRY CARD

# THE FUTURE Building on Mars and living off the land.

BY KEITH DAWSON

It is likely that sometime in the next 10 or 15 years, we will see astronauts taking their first steps on Mars, followed by the first wave of long-term exploration there. What once looked like mere science fiction is now the domain of technology planners who are trying to determine the best way to build structures for long-term living and working on Mars.

Although much farther away than the Moon, Mars is a warmer, windier, far more Earthlike place with distinct seasons. Once you accommodate the need for airtight containment and pressure resistance, the constraints of building structures on Mars are not too different from those of building on Earth. You can use much of the same available material. The real questions, then, are what can be found, made, or transported there, and how to make use of the materials.

**Robert Zubrin of the National Space Society explains that within 10 years we could be visiting Mars, with the hope of future colonization.**

Robert Zubrin, an astronautical engineer with the National Space Society, a research center, is one of the founders of Mars Direct, a program that proposes sending people to Mars for colonization. The plan emphasizes the use of currently available technology to send equipment, fuel, and machinery to a landing site on Mars and to prepare locations for people to inhabit. The key element in the Mars Direct plan, says Zubrin, is "living off the land," or making use of Mars's natural resources to create fuel for the return flight and for the construction of additional structures beyond the initial habitation units.

A report published for NASA in February of this year by a panel of scientists and engineers at the National Research Council lent support to this approach. Space-based natural-resource extraction was one of six areas that the report recommended for modest investment by NASA to achieve the most technological development between the years 2000 and 2020.

Zubrin explains that within 10 years we could be sending the first wave of explorers on missions that would last several years and cost dramatically less than NASA's estimates for similar programs in the 1980s. He has proposed (and current NASA planners now endorse) a plan that includes, as a starting point, prefabricated, tuna-can-shaped, metal habitation units that would be large enough to house the crew of a mission.

Zubrin says that they will be able to use indigenous materials to build add-on structures. For example, the compounds necessary for making Portland cement—calcium, gypsum, lime, and mortar—are in ample supply on Mars. Ceramics, concrete, and steel can all be fabricated on Mars with present-day technology and used in surface construction.

Given Mars's low gravity (slightly more than one-third that of Earth), some materials may be easier to use there because of their lower weight: steel becomes as easy to manipulate as aluminum. Brick can also be made on Mars, says Zubrin, and will probably be used in the first structures.

Once settlers are ready to branch out beyond their tuna cans, add-on structures can be built on the surface or below the ground. In either case, they must be able to retain their atmospheric pressure and screen out the high level of background radiation coming through Mars's thin atmosphere.

Going underground would mean using earth-moving equipment to dig trenches, which would be filled with a concrete foundation and a series of brick-and-mortar arched roofs. These would be covered with a layer of sandbags to maintain the internal atmospheric pressure and screen out radiation. The problem with this approach is that it is incredibly labor-intensive; of all the construction elements that must be transported to the surface of Mars, labor is the most difficult and the most expensive.

Zubrin leans instead toward building domes made of a metal geodesic framework and covered with layers of plastic fabric and an antiradiation coating. From a human point of view, the advantages are obvious: a more spacious environment with natural light. "You get a large living space," he says. In addition, domes are less labor-intensive. "What you have to do is excavate a crater, as opposed to building Roman arches underground."

As Mars Direct helps collapse the time line for exploration, the tools for building on the planet are already available. Neither fabricating materials nor actual construction on Mars is impossible; the greatest difficulty is getting finished products from here to there. But once the challenges of constructing the international space station are conquered, building on Mars may seem almost easy. ■

*Keith Dawson is a freelance writer based in New York City.*

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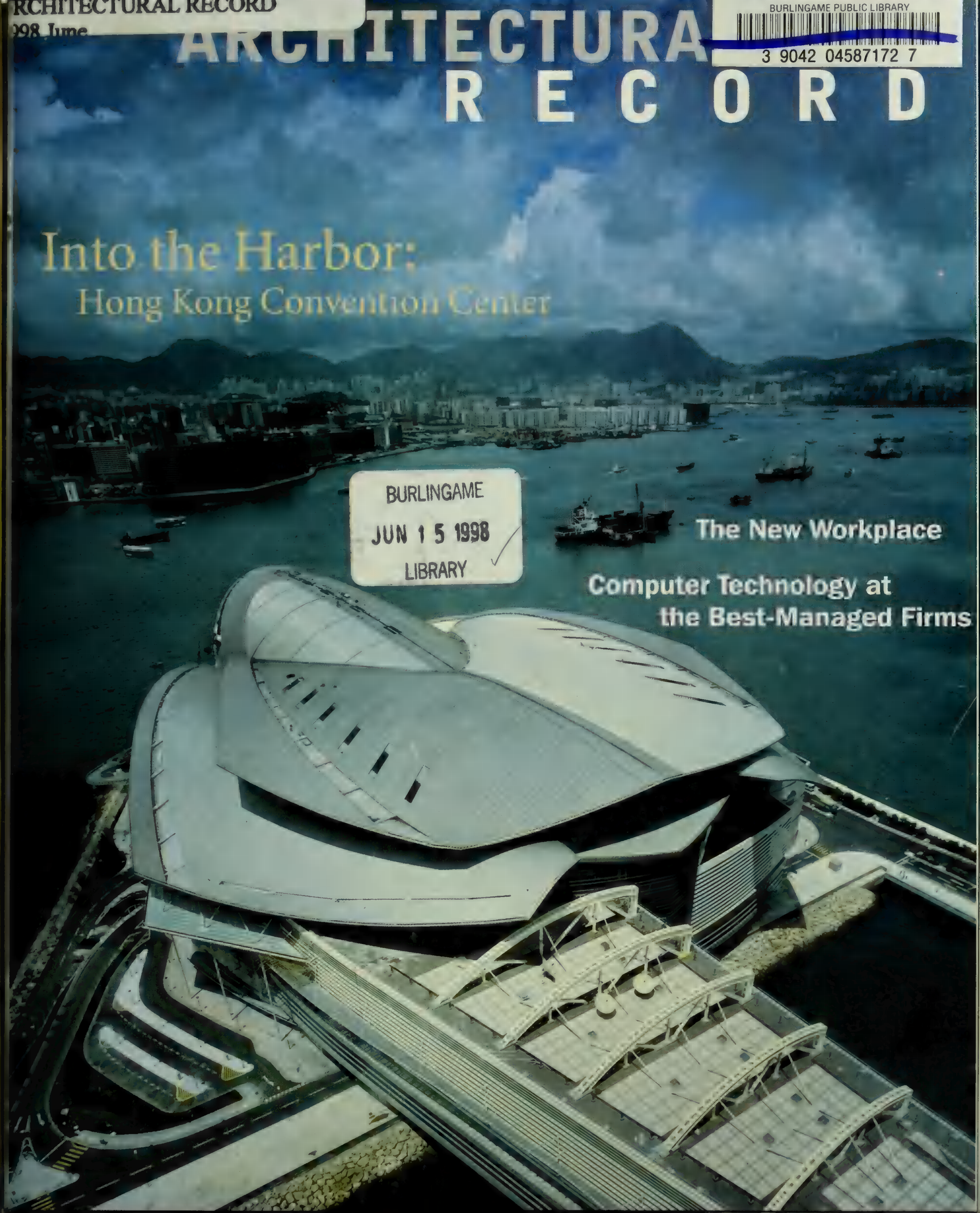

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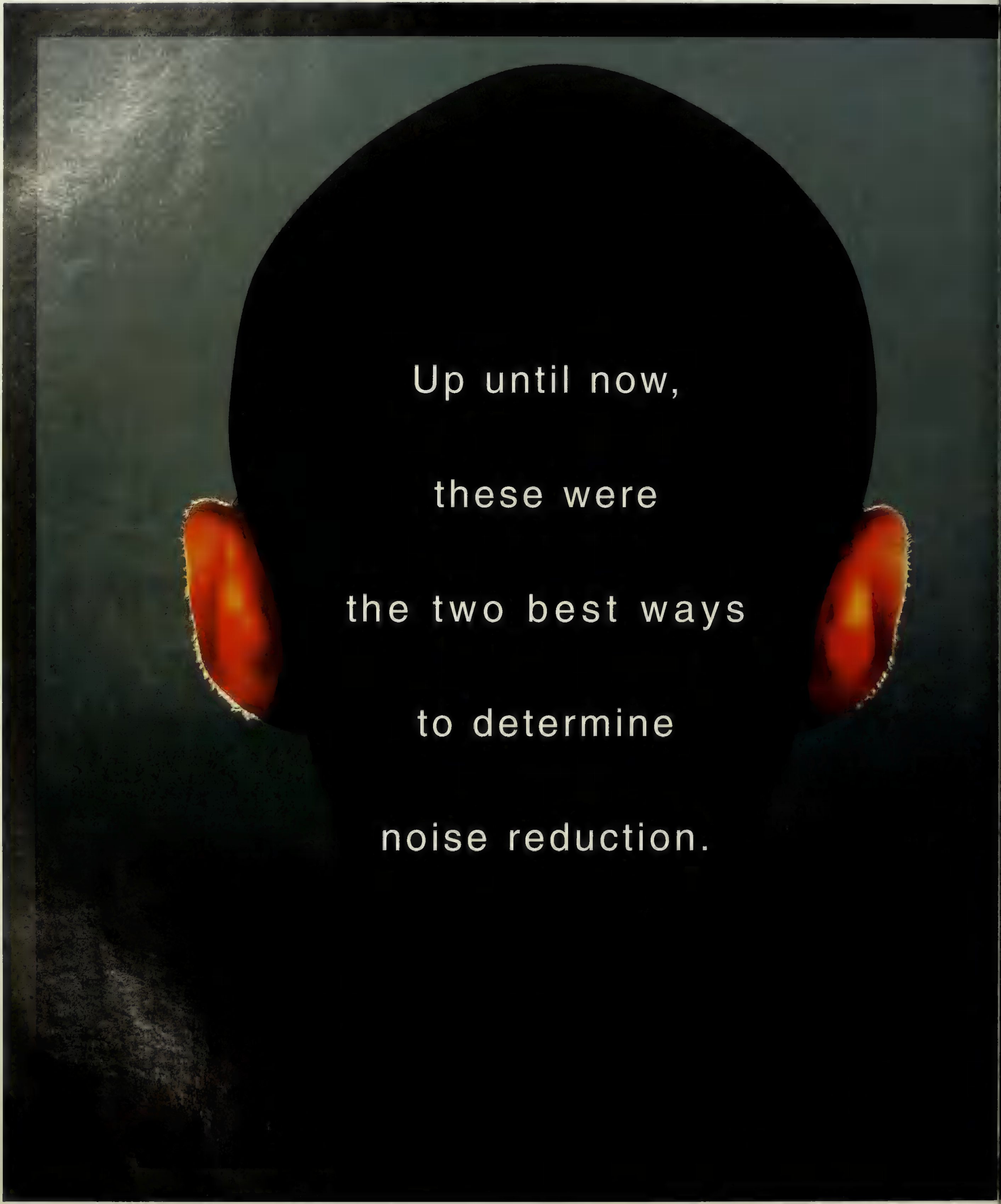
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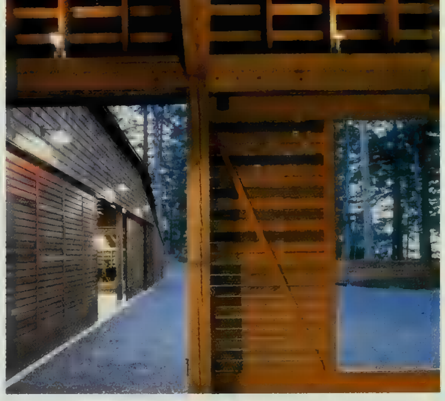

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**Continuing Education:** *The AIA/ARCHITECTURAL RECORD continuing education opportunity this month is "Changing the Face of Practice with Digital Technologies" (page 72). The self-report form appears on page 230.*

**Cover:** *Hong Kong Exhibition and Convention Center Extension. Wong & Ouyang; Skidmore, Owings & Merrill. Photo © Steinkamp/Ballogg.*
**Above:** *Equipment Building, San Juan Island, Washington. Thompson and Rose Designers. Photo © Chuck Choi.*

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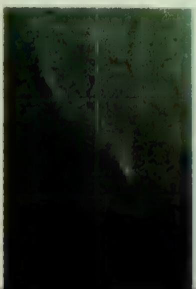

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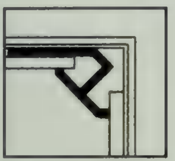

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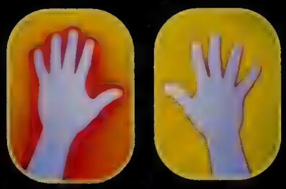

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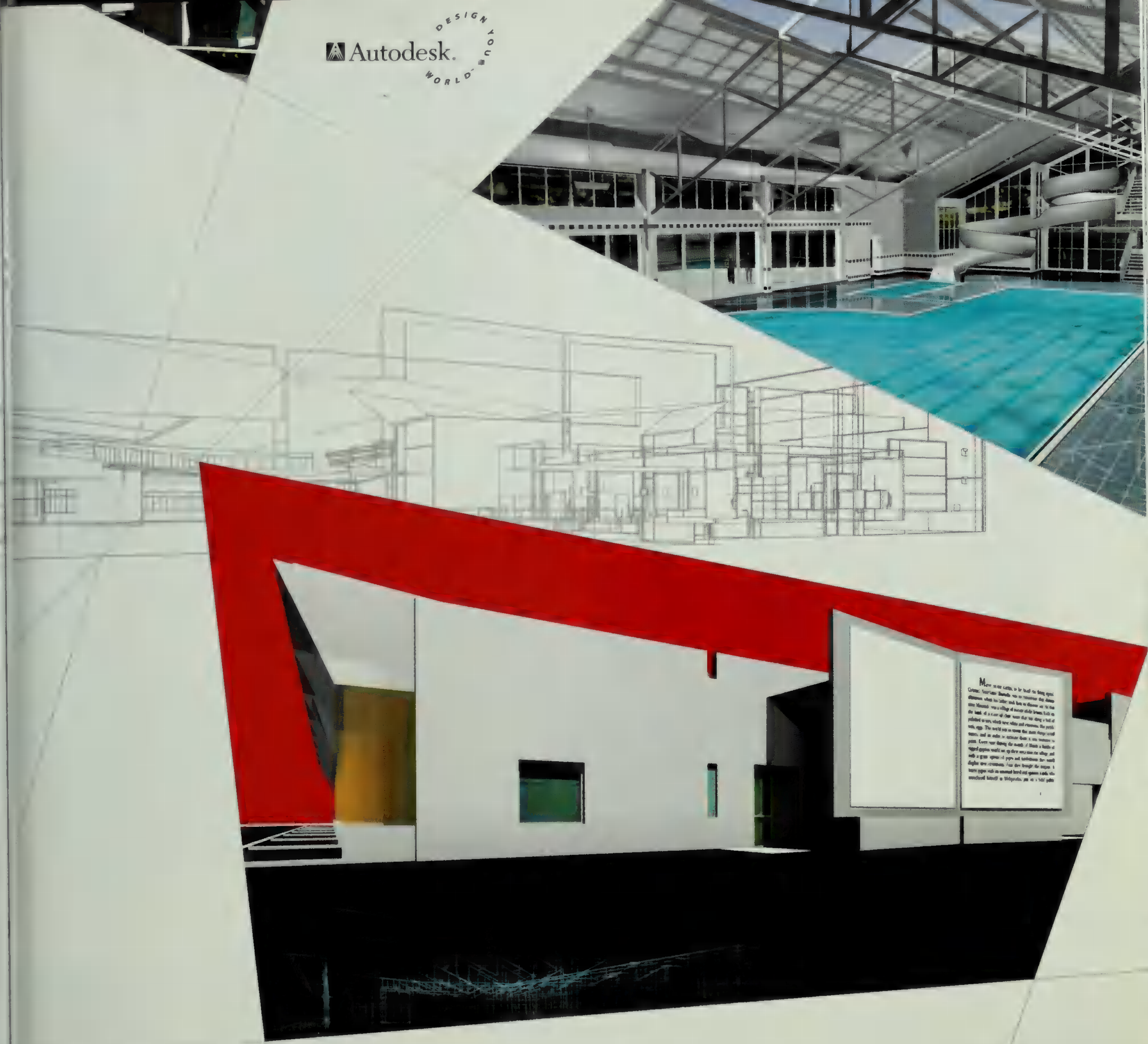

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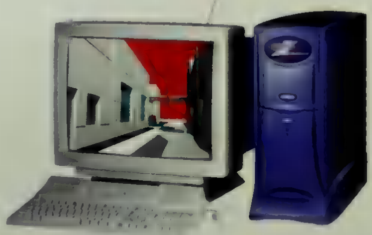

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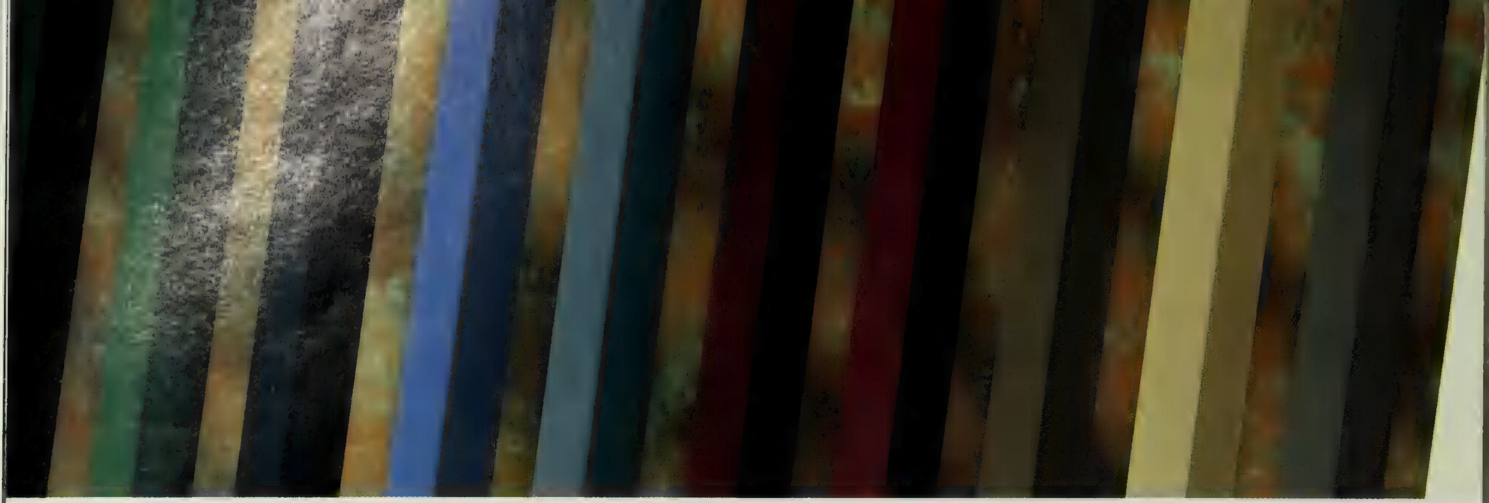

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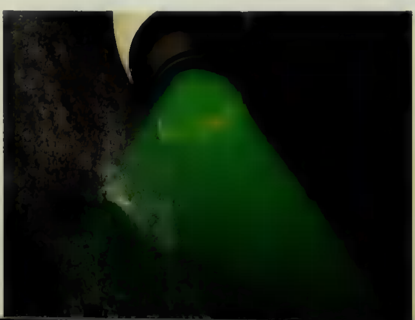

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## EDITORIAL

# Architecture without borders

### BY ROBERT A. IVY, FAIA

*In a sense, this is the American moment in architecture. As the world shrinks and global commerce is ascendant, as Europe's borders and competing currencies melt away, American architects are finding a worldwide appreciation for our particular organizational skills, our technical wizardry, our access to clients and capital, and our ability to get things done. The whole world seems hungry for American skill.*

*Check the international waiting rooms at JFK or Sea-Tac airports. The 747s are packed with Armani-clad design professionals, busy calculating their frequent flyer miles as they speed toward work abroad. A subculture is developing among American architects who are comfortable in the best hotels in Hong Kong, able to order meals in German in Cologne, and adept at translating the British pound to dollars.*

*Who are these road warriors? Large firms, those with 50 or more employees, account for most of the business: 40 percent or more can claim work overseas. Since it takes money and effort to sustain business outside the United States, smaller firms, particularly those with a specialty, tend to join larger American or foreign companies. Well-known designers from the United States regularly enter and win international competitions. While the percentage of all firms working outside North America may be small, it matters, since it represents a trend toward broader markets in a changing world.*

*The global practice of architecture came about in part because of quantum advances in transportation and communication technology. Cell phones, faxes, and laptops permit instantaneous conversation between continents and the simultaneous transmission of plans and specifications through cyberspace; jumbo jets can land on the smallest archipelagos.*

*If this mobile, hip scene sounds attractive, there are complications. Virtually every firm engaged in international work finds itself married, sometimes in a shotgun wedding, to foreign companies with very different professional cultures and work ethics, as well as variance in training and a predilection for their own construction methods. In Russia, protocol with clients demands entertaining into the night, vast reserves of vodka, and infinite patience; in Portugal, shop drawings seem to be the exception to the rule. Such differences demand adjustments in our methodology and attitudes.*

*The ride can be bumpy. Political systems founder, and currencies tumble overnight. Consider the firms that gambled heavily on the Asian economy only to face big write-offs with their Seoul or Bangkok clientele. Lawsuits, bankruptcies, courts, and lawyers plague every continent except Antarctica.*

*Here is another concern. While our acumen is sought after in other countries, it may engender a subtle backlash, to which we all should be attuned. With the end of the Cold War and the opening of world markets, we can easily be perceived as shifting into a kind of neocolonialism, where American planning expertise and heft overshadow those of our international partners. Our designs are sometimes not as universally admired as are our more pragmatic skills: not all the French welcomed McDonald's to the Champs Elysées.*

*The lessons for American architects resonate at home and abroad. We must become acutely responsive to the unique cultures we serve, avoiding imposed solutions and seeking answers in the matrix of each project. On a Chilean street, for example, there is no call for a generic office building that would be better suited to California. We must listen to our peers overseas and observe how they live, respecting their skills and their appreciation for cultural nuance. We have much to learn, and they can serve as our guides.*

*If American architects set aside our hubris and open our eyes and ears, all of our work should mature as our fortunes expand. This moment may seem to be our own, but the perception is illusory: it belongs to a larger, richer world.*

Robert Ivy

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**CIRCLE 10 ON INQUIRY CARD**

# LETTERS

### Germany's architectural wave

Claudine Weber-Hof claims that "the architectural wave Germany is riding is really a tectonic tsunami, a phenomenon unparalleled anywhere on the continent" [Correspondent's File, February, page 41]. I'd agree: no country in Europe employs so many architects as a percentage of building costs, has produced so many unemployable dilettantes from its universities, or suffered so many architects' bankruptcies. No other country supports a construction industry where the cheapest house costs the equivalent of $277,000 or tolerates a tortuous and time-wasting building-approval process that rewards political connections and enjoys such cavalier rights of rejection.

*—Bill Collett*
*Philadelphia*

### Arrogance and the spec house

I read with interest about Riverbend House, designed by Hariri and Hariri for local developer Manou Faily ["Making a Spec House Special," April, page 70]. The article fails to point out that, as a speculative investment, Riverbend House is a disaster. I believe that this situation is due largely to the professional arrogance of out-of-town architects who apparently pride themselves on ignoring a rich local vernacular and who have misread the realities of our local marketplace.

In 1988 I sold 21 lots in my Riverbend subdivision, including this site, to a local architect–spec builder, whose lender ultimately foreclosed. Our local landscape is littered with the financial corpses of architects, builders, and lenders who have similarly failed at marketing million-dollar spec homes. In the case of Riverbend House, this completed white elephant has languished on the market for a year, and the asking price was recently dropped from $1,150,000 to $950,000. The $165,000 "hit" doesn't include the opportunity cost of perhaps $90,000 in lost interest, and the story is not over.

On a final note, I am surprised that RECORD still applies the cliché of "California contemporary"; these houses happen to be Virginia contemporaries. Some are inspired and successfully respond to the setting, financial as well as physical; others, like Riverbend House, fail, both as architecture and as investments, because they ignore it. When will architects learn?

*—John G. Colby, AIA*
*Great Falls, Va.*

### Answering interior designers

I was very disappointed with the forum discussing the relationship between interior designers and architects ["Listening to Interior Designers," April, page 66]. Instead of investigating how the relationship could improve, the panel simply offered ridiculous generalizations about our profession and revealed the interior designers' painfully narrow point of view.

I have tremendous respect for the interior designers with whom I work. A talented designer brings a fresh perspective and expertise to the table, which augments the architecture and enriches a project for all those involved. But the interiors are just part of the big picture.

Architects deal with a multitude of complex problems that need to be solved quickly and cleanly, from disputes with regulatory agencies to managing dozens of consultants simultaneously. The thought that architects design from the outside in is preposterous. A building's end result need not only be dazzling, it must also be appropriate and, yes, even legal.

*—James Mehaffey, Assoc. AIA*
*Lancaster, Pa.*

Reading "Listening to Interior Designers" upset me. As a commercial interior designer, I have had conflicts with architects. But this problem won't improve with articles like this one circulating.

Many of the differences between architects and interior designers go back to our system of higher education. We are taught differently, but not as differently as David Ling maintains in the article. While I was working on projects with real clients who had real budgets and real programs, my friends in architecture school were designing conceptual models. Sure, we learned about color and furniture and draperies. But we also learned how color affects patients in psychiatric wards, how furniture is constructed, and which drapery fabrics help control the spread of flames.

One of the most enriching design classes I ever had was a joint studio with fourth-year architecture students. Working side by side with architects is what I do every day, and even though that studio revealed a lot of our differences, it also taught us all how to achieve our goals in spite of those differences.

*—Jill M. Watkins, IIDA*
*Cleveland*

### The competition question

A successful competition ["Playing the Competitions Game," November, page 62] depends on a multiplicity of factors: the program, the jury, terms fair to the architects, good judgment, time frame, feasibility, and credibility.

I believe that a lot of damage has been done to the environment and the profession, particularly in Europe, by a blind adherence to the belief that competitions will produce brilliant designs. In fact, *competitions* is too limiting a term. What is required is a carefully designed method for finding the right architect to address the needs, program, and aspirations of the client.

*—Bill Lacy, FAIA*
*Executive Director*
*The Pritzker Prize Committee*
*Purchase, N.Y.*

### Bamboo technology

Thank you for putting the time and effort into writing such a forward-thinking article about building with bamboo ["The Future," April, page 200]. I'm glad that there are people willing to keep the architecture community informed about new technologies, like bamboo, that are not so obviously new.

The article mentions the work of my brother, Jeffree Trudeau. Along with his colleagues, Jeffree makes significant sacrifices to develop technologies whose importance it will probably take many years for most people to fully grasp.

*—Bart Trudeau, AIA*
*Principal*
*Trudeau/Architects*
*Latham, N.Y.*

### Proper credit

I see that RECORD typically lists credits for the projects featured inside. Usually listed are the architect, the engineer, and the contractor. My question is, Who actually "built" those beautiful works of architecture featured in your pages? Who laid the tiles, painted the walls, did the carpentry, installed the electrical work, and so on?

Why doesn't RECORD list the subcontractors by trade and company name? Shouldn't you give credit where credit is due?

*—Paul Peterson*
*via E-mail*

### Credits/corrections

The name of Carol R. Johnson Associates was misspelled in a news item on the Boston Federal Courthouse (May, page 77).

The name of Erik Kvalsvik, whose photographs of the White House appeared in "America's Most Visited Houses" (April, page 76), was misspelled in the photo credits.

LMN Architects designed Redmond Town Center, which appeared in "Retail Facilities: Main Street Goes Suburban" (March, page 126).

*Letters may be E-mailed by visiting www.archrecord.com and clicking on News/Features/Dialogue. RECORD may edit letters for grammar, style, and length, taking care not to change the meaning.*

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CIRCLE 11 ON INQUIRY CARD

# SPEAK OUT Sixteen keys to success offered by principals of Centerbrook, winner of this year's AIA Firm Award.

### WILLIAM GROVER AND JAMES CHILDRESS

*William Grover, FAIA, worked with Charles Moore for 10 years before becoming president of Moore Grover Harper in 1975. James Childress, AIA, joined Moore Grover Harper in 1979. The firm's name was changed to Centerbrook Architects in 1982.*

1. It is bad luck to turn down a job. Every job is an opportunity to design something.

2. Art always comes first; money is second (a close second). You can't keep doing art if you have no money.

3. Don't be disappointed if a client rejects your design. It is another opportunity to design. You like to design and there are many answers to the same problem.

4. Always exceed your client's expectations. This means establishing realistic expectations that you can exceed.

5. No matter what they may say, or what you may think, cost is foremost in the minds of all clients regardless of how wealthy they may be. Make sure everyone has a clear, written understanding of the expected cost of the project. Have a plan of how you will proceed if it comes in over budget.

6. Meet with your partners, senior staff, office manager, and bookkeeper every Friday for a one-and-a-half-hour lunch in a private room in a nice restaurant away from the office. Avoid invitations to other places on Fridays. Follow an agenda. Review finances and schedule each employee's time for the next week. Strictly limit the meeting to one and a half hours. Everybody should get up and walk out when the time is up. If you don't, the meetings will get longer and nobody will want to waste their time on them.

7. Be as diverse and flexible as possible. Everybody should be able to do everything—write good letters, spell, get jobs, design, build models, take out the trash, make a good cup of coffee, charm clients and contractors, do construction documents. Don't compartmentalize. The one exception is photography.

8. Have projects professionally photographed. Spend money for the best professional architectural photographer you can find. Map out the views you want on a plan of the building. Go to the job site with the photographer. Explain what is most important to you about the building and what views are most exciting to you. It may seem expensive, but it will be money well spent.

9. Enter awards programs, especially ones sponsored by the state, regional, and national AIA. Make the presentation simple and beautiful. Never, under any circumstances, include a bad photograph in a presentation, no matter how important you may think it is in explaining your concept. If at first you don't win an award, keep entering the project. The juries are always different. If it's a good building, some jury will recognize it.

10. Learn to recognize problems as opportunities to show how good you really are.

11. Bad news travels fast. An unhappy client will spread the word about you. A satisfied client will be a good friend and a good reference. Remember this when you are tempted to tell a client to go to hell.

12. Surround yourself with the most talented and enjoyable people you can find and take good care of them. Put them at the top of the wage scale. Pay them time-and-a-half for overtime; give them two weeks of paid vacation (three weeks after seven years); provide health insurance without co-payment (it is possible if you aggressively pursue insurance companies); and, most important, give people pride of ownership in what they are doing. Give them credit—publicly and in print—for their design contributions. Architecture is not done by a single person.

13. Share financial information with all employees. Empower them to be responsible for time and money budgets. They should all, even student interns, know the budget constraints and have a say in what they can do by when.

14. Maintain a sense of creative energy by not having private offices, mixing partners and staff together, and spreading jobs throughout. Have one coffeepot where everyone has to meet.

15. If you focus on making every project an artistic success, you will get rich. If you give first priority to making money, you will go broke.

16. Clients are spending a lot of money for your advice. They should enjoy themselves. You should too. ■

**Contributions:** *If you would like to express your opinion in this column, please send submissions by mail (with a disk) to Speak Out, Architectural Record, 1221 Avenue of the Americas, New York, N.Y. 10020; by fax to 212/512-4256; or by E-mail by visiting www.archrecord.com and clicking on News/Features/Dialogue. Essays must not exceed 700 words. The editors reserve the right to edit for space and clarity. Where substantial editing occurs, the author will receive text approval.*

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CIRCLE 12 ON INQUIRY CARD

# MENTORS A "matchmaking" expert describes the advantages of working with an executive search firm and gives pointers on choosing the right one.

*Donna Gaines is president of Gaines & Associates International, an executive search firm specializing in the fields of real estate, design, and construction. The 17-year-old firm has offices in Chicago, Atlanta, Albuquerque, and New York City.*

*ARCHITECTURAL RECORD asked Donna Gaines to discuss the process of hiring and working with an executive search firm to help fill positions within your company.*

To be truly effective and stand apart from your competition in today's marketplace, you must be able to identify and attract job candidates who are qualified, experienced, and innovative—exceptional people with leadership potential. Sounds easy, but where do you start?

The easiest, most economical, and practical place to begin is with networking. Tell your staff you're looking for new blood and let them help you find good people. Posting openings allows current employees to consider applying themselves. Offering them incentives, such as finders' fees, encourages them to take an active part in your search. Also, making use of professional societies' job listings can target specific audiences.

A college recruitment program ensures a continuing flow of good candidates. Campus recruiting adds a useful marketing dimension to your search because it publicizes your company's name to tomorrow's corporate principals and presidents.

Broad-stroke advertising in help wanted pages of trade publications and newsletters can be effective, depending on current employment levels and the types of positions you're trying to fill.

Search firms can do much of your work for you, especially when you're looking to fill managerial and technical positions. At first blush you might think search firms are beyond your means. But can you really afford to hire an individual who won't fit into your company's culture or, even worse, someone who may cost you tens of thousands of dollars by making performance or judgment errors?

Executive search firms produce both direct and added-value results. They can explore and penetrate larger pools of candidates than you could reach alone and can increase your chances of finding the best people by conducting focused and confidential searches. The "matchmaking firm"—a more accurate term than "headhunter"—evaluates candidates objectively, thoroughly investigates references, negotiates compensation packages, and ensures as much as possible the best fit between your company and the candidates you hire.

Search firms probe candidates for reactions, vision, and goals while presenting your company's mission and possibilities. It is their business to analyze and match mutual expectations, helping to turn them into shared advantages.

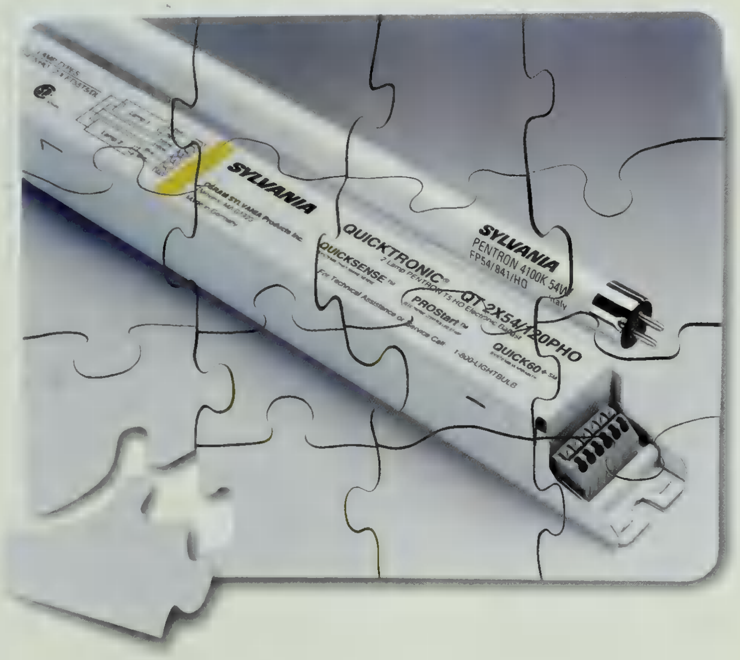
The easiest way to evaluate a search firm is to ask key questions and compare the firm's responses to your company's needs and ways of doing business. Here are some of the most important questions to ask:

1. What ethical guidelines do you follow when conducting searches?
2. What other searches have you done? (Names and companies may be confidential, but the matchmaker should be able to describe the nature and results of past searches. Whatever the case, ask for references—then check them.)
3. Who will do the work?
4. How soon, how often, and in what form will I receive feedback?
5. What is your fee structure? Do you work on a contingency or retainer basis?
6. What expenses are reimbursed? Do you mark up research and administrative costs? How detailed are your invoices?
7. What guarantees do you provide?

Ask how the search firm conducts assessments and evaluations. How does it determine whom to check as references? How does the matchmaker structure interviews, and what input will you have in presenting questions? If appropriate, how will the search firm conduct testing; license, professional, credential, and other verification; and behavior and character appraisals?

Look for ways to work collaboratively with the search firm you select. Become involved in the search and help the firm understand who and what your company represents. The results will save you time, expense, and frustration, and in the end will benefit your company. ■

**Questions:** *If you have a question about your career, professional ethics, the law, or any other facet of architecture, design, and construction, please send submissions by mail to Mentors, Architectural Record, 1221 Avenue of the Americas, New York, N.Y. 10020; by fax to 212/512-4256; or by E-mail by visiting www.archrecord.com and clicking on News/Features/Dialogue. Submissions may be edited for space and clarity.*



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**CIRCLE 13 ON INQUIRY CARD**

# PULSE RECORD readers were asked: Should the unbuilt work of significant designers be resurrected and constructed by contemporary architects?

**No:** There are a number of great designs conceived in the present that have yet to be realized. Wouldn't it be more exciting to build some of these first before turning to the past for inspiration?
*—Henry T. Chao, AIA*
*Boston*

**No:** Architectural expression is related to the architect's responses to codes and program. Building an unbuilt work designed in a different era, with different codes in place and a different program, is not the same as, for instance, performing a classical masterpiece in the present.
*—Donald F. Vidal, AIA*
*Camden, N.J.*

**No:** The public may want this, but who cares? Design is of the time and place it was created. A great design will have relevance in its particular era. If you could ask the original architect to design the same building for the present, I'm sure he would want to significantly change the design, if not completely rework it from scratch.
*—Ronald M. Reim*
*St. Louis*

**No:** It's impossible to realize someone else's vision. Consider, for example, Alvar Aalto's Washington Seminary.
*—Frank Douglas, FAIA*
*Houston*

**No:** It's like taking a '23 Packard, which was grand in its time, and building it today. If the building couldn't even be built when the time was right, it certainly won't be right for now.
*—Robert Swan, AIA, CSI*
*New Orleans*

**No:** Only if it's a Frank Lloyd Wright.
*—Fred Rick Minson, AIA*
*via E-mail*

**No:** During the course of his long career, Frank Lloyd Wright himself recycled ideas, but as part of his evolving process of design. To take a design from another time, site, and client is to separate the design from its originating culture. Resurrecting projects that had previously been lost to history only reaffirms the lack of any true culture or talent in our present.
*—Eric Corey Freed*
*San Francisco*

**No:** On the whole, it's probably better not to. There's something nice about a project remaining unbuilt; more is left to the imagination. If you are going to do it, though, you have to keep in mind that architects of the past continually revised their designs during construction. You therefore have to respect decisions made by those interpreting the design for present circumstances.
*—Coreina Chan, Shawn Watts*
*Leroy Street Studio*
*New York City*

**No:** Let's look forward, not backward!
*—Herman Orcutt*
*Phoenix*

**Yes:** If someone thinks it is worth building, that's great. But only if the contract documents are completed, checked, and coordinated by the significant designer. Those who have tried to interpret the designs of others usually don't do a good job.
*—William Krisel, AIA*
*Los Angeles*

**This Month's Question**

## Do architects make good clients?

A number of architecture school graduates have found jobs outside traditional practice. They find employment in a variety of settings: in government, on campuses, as developers, and as real estate coordinators. Many eventually serve as clients for other architects. Do client-architects, sometimes not trained formally in management or business, serve effectively as clients?

**Do architects make good clients?** ☐ Yes ☐ No

Copy and fax this form to 212/512-4256; or, to respond by E-mail, visit www.archrecord.com and click on News/Features/Dialogue.

*Note: Pulse reflects individual responses to each month's question and is not meant to be construed as formal research.*

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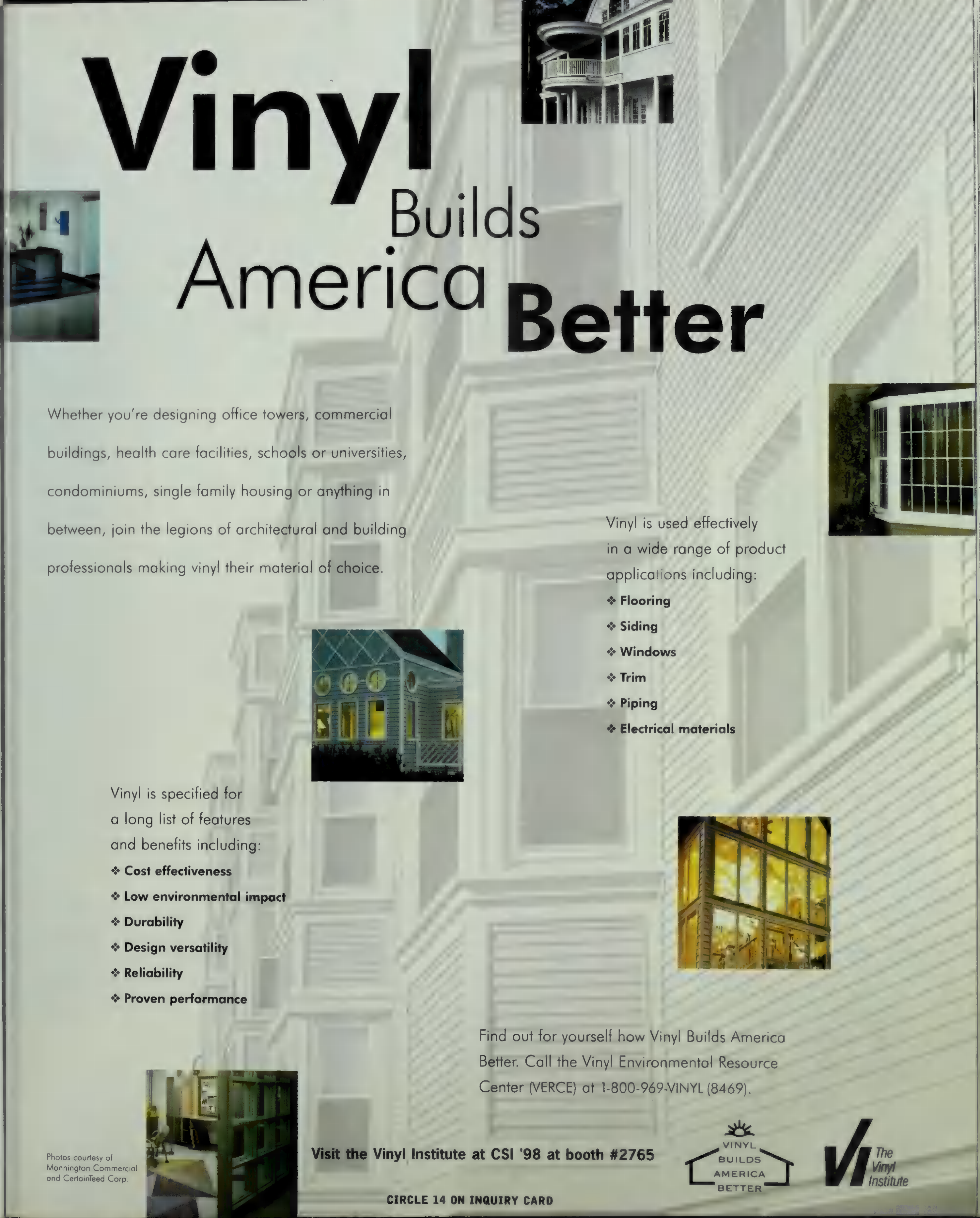

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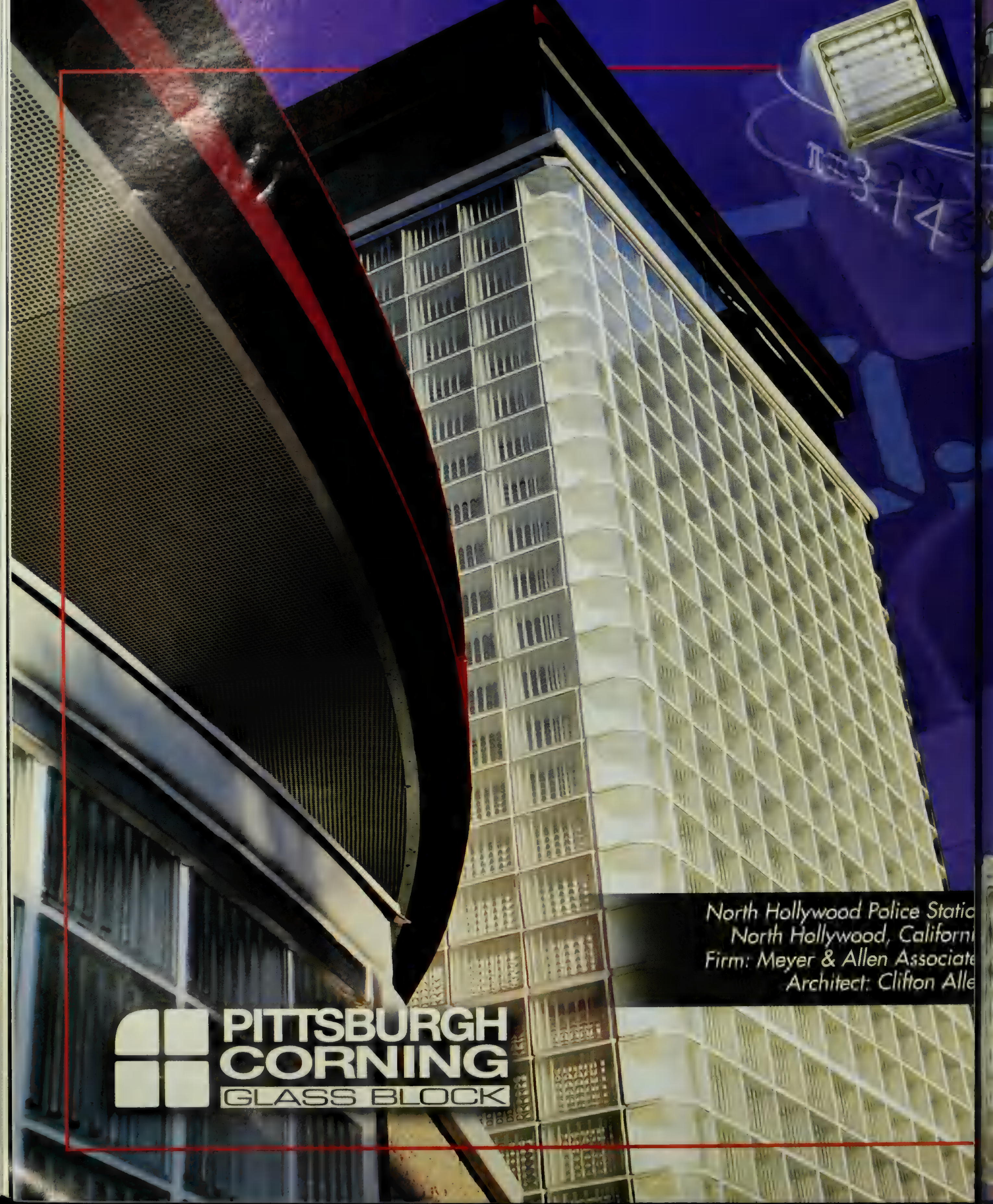
CIRCLE 14 ON INQUIRY CARD



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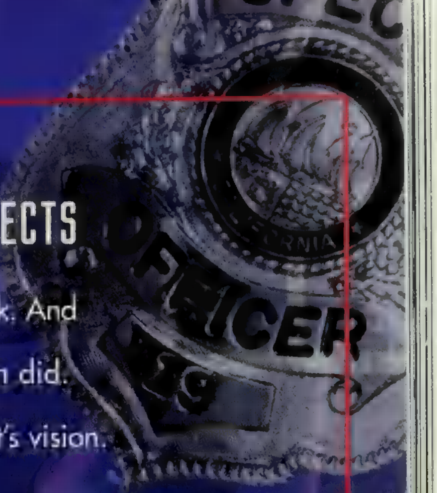

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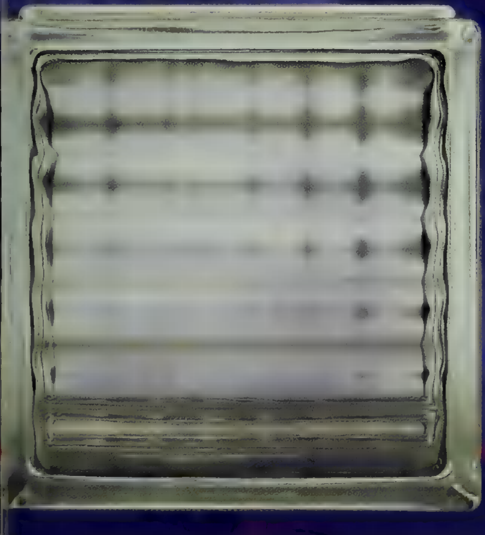

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CIRCLE 17 ON INQUIRY CARD

# CORRESPONDENT'S FILE An ambitious mayor and major plans for the Millennium are making the Eternal City a hotbed of design.

### BY ILENE STEINGUT

*Ilene Steingut has practiced architecture in Italy for the past 15 years. She has offices with her husband, Giuseppe Vallifuoco, in Rome and in Cagliari, Sardinia.*

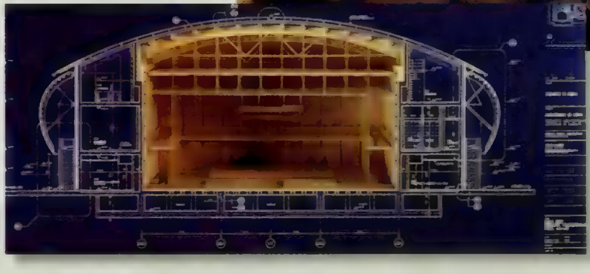
After what seemed like decades of relative inactivity, architecture is in the forefront in Rome. Although the historic center and the many archaeological monuments will always occupy a primary role in the public's perception of the city, Rome's planners and administrators are now grappling with problems of designing and managing a modern metropolis.

While some of the current spurt of activity is a result of commissions undertaken by previous city administrations or other institutions, much of the action is being propelled by mayor Francesco Rutelli, who took office for his first term in 1993 and was subsequently reelected in 1997.

## Man with a plan

The Rutelli administration articulated its position regarding the city's overall planning strategy early on. Traffic, air pollution, the deterioration of historic monuments, and the effects of a vast amount of unplanned building and illegal construction, together with the admitted failure of the 1962 city plan and its successive variants, led to a rethinking and reviewing of the strategy.

The new perceptions by Rutelli and his cohorts eventually produced the existing city plan, approved by the city council in July 1997. The Piano delle Certezze (the Plan of Certainties) was declared a first step in drawing up an entirely new formula that seeks to stimulate a process of urban growth and development in qualitative rather than quantitative terms.



**Work has begun on Renzo Piano's new Auditorium; for one of the first times in contemporary Rome, archaeological relics found on the site are being integrated with the building.**

PHOTOGRAPHY: © G. BERENGO GARDIN

The Piano delle Certezze's guiding principles address the problems of three major planning areas: open green space within and surrounding the urban heart of Rome; the built urban fabric; and traffic and mobility.

Among the various goals set forth by the administration, the most decisive action has been taken regarding the city's existing public surface transport system, a key element in the new plan. Modernizing this system and increasing its capacity will help create new urban poles to catalyze renewal, giving energy and quality of life to areas formerly devoid of these characteristics.

## The Millennium approaches

The emphasis on public transportation has also been a necessary factor in the planning of the Catholic Church's Jubilee celebration in Rome for the year 2000. Myriad important works are planned for that event, with most having to do with the restoration of important monuments, museums, and archaeological sites, as well as the necessary infrastructure and hospitality for the predicted influx of 24 million visitors and religious pilgrims during the course of the Holy Year.

Unfortunately, and perhaps embarrassingly, the city canceled the construction of the Castel Sant' Angelo underpass, which would have been the hallmark public works project for the event. However, a parking structure for 105 buses and 800 cars will be constructed underneath the Gianiculum Hill adjacent to the Vatican, and according to the special office set up for the Jubilee Celebration, over 80 of the 109 planned projects are under way, turning the city into a huge construction site.

In February, the mayor optimistically stated that the only construction site that will be visible in 2000 will be the open-air exhibit of the ongoing archaeological excavations of the Roman Forum, indicating the administration's ambitious intentions to complete all other work by that date.

### A lengthy project portfolio

While the Jubilee has major ramifications, perhaps the most visible sign of new architectural vitality in Rome is the construction of the Auditorium—the city's performing arts center—in the Flaminio neighborhood near Villa Borghese. Ending a decades-long saga involving competitions and site changes, nine invited submissions were judged in 1994; Renzo Piano's winning project is now under way. The first part of the parking structure as well as foundation piles are completed and work has begun on the 500-seat concert hall.

For one of the first times in contemporary Rome, important archaeological relics found on the site are being coherently integrated into the building project, rather than indefinitely halting construction (as is currently happening with the new subway in Athens). According to Piano's office, the entire complex, composed of three scarab-like forms and an amphitheater, is slated for completion by November 1999.

The Rutelli administration has undertaken many other projects. The city sponsored a competition in 1995 for the Borghetto Flaminio, a deteriorated former industrial zone in a neighborhood just outside the Porta del Populo and Villa Borghese (the area was once designated as a site for the Auditorium).

The winning project, by Antonello Monaco, now in the construction documents phase, proposes a cultural center whose volumes create a series of open spaces on the sloped site while respecting many of its preexisting elements.

In 1996, Richard Meier was asked directly by the city administration to submit a proposal for the redesign of Piazza Augusto Imperatore as well as for a container to replace the 1938 glass structure protecting the Ara Pacis (a partial reconstruction of an altar dedicated by Augustus in 9 B.C.). In an interview earlier this year, Rutelli reiterated his commitment to complete this project in time for the Jubilee.

This isn't Meier's only project. In 1994, a competition for two churches in outlying neighborhoods resulted in a first prize for only one of the sites; Milanese architect Bruno Bozzini's church has already been completed. For the second site, the church administration subsequently invited a new roster to propose the "Church of the Year 2000." Meier's selected project, with its three double-curved shells, is becoming a testing laboratory for innovative building technology and construction methods.

PHOTOGRAPHY: © RICHARD MEIER & PARTNERS (ARA PACIS); R. CAROTENUTO (BOZZINI)

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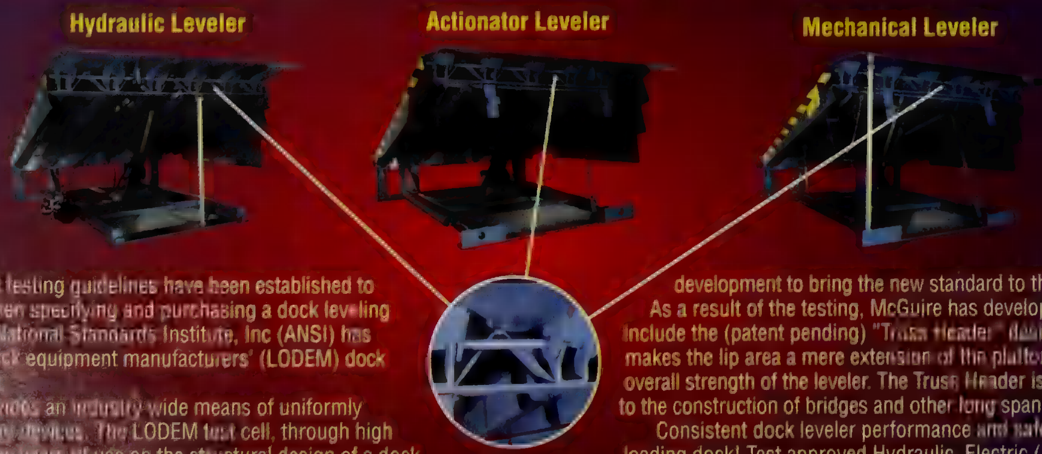

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Meanwhile, the city administration commissioned INARCH, the National Institute of Architecture, to compile regulations for an intra-European (if not international) competition for the city's new Directional System, where the 1962 city plan had called for the construction of a civic hub of offices, government ministries, and commercial activities in the Pietralata neighborhood.

Only part of the vehicular axis that was to connect this new urban pole to the city center was built, leaving a vast urban void in the midst of what is now a densely populated area. The consultation was a first step in the resolution of the neighborhood's urban problems; it has now been made official that the city will hold separate competitions (the forms of which are yet to be determined) for four strategic sites in the zone.

At almost the same time as the Pietralata consultation, the State Railway Company invited international architects to contribute ideas for the Tiburtuno Rail Station and the surrounding undeveloped area. This zone is destined to become one of Rome's most crucial nodes, given the city's strategy of extending the potential of existing surface railway lines and stations.

Nearby, on the site of the former Centocelle airport, an international competition was held for the design of an urban and archaeological park. Results of the competition were announced last summer; the winning project, by British architect Mark Ruthwen, is conceived as an urban forest in which open spaces are created for various leisure, recreational, and cultural uses.

Next, the city administration, within an urban renewal program called Centopiazze (One Hundred Squares), held a national competition called Neighborhood Squares for the renovation of a significant piazza in each of the city's 19 administrative districts.

At the same time, a series of construction sites were begun in select squares located throughout the city.

**Richard Meier's Ara Pacis design (opposite); Bruno Bozzini's church, recently commissioned by the Catholic administration (right); Michael Hopkins's design for the Tiburtuno Rail Station and surrounding neighborhood (above right).**

### The best-laid plans

With the number of large projects being undertaken, some question whether the transformation will be complete by 2000. In Italy, it is acknowledged that it takes two years longer than in other European nations to complete a building project. In Rome, great effort is being made to effect not only physical and functional change, but the way in which that change is managed.

The coming years will demonstrate if these efforts meet the expectations of the mayor and his citizens. ■

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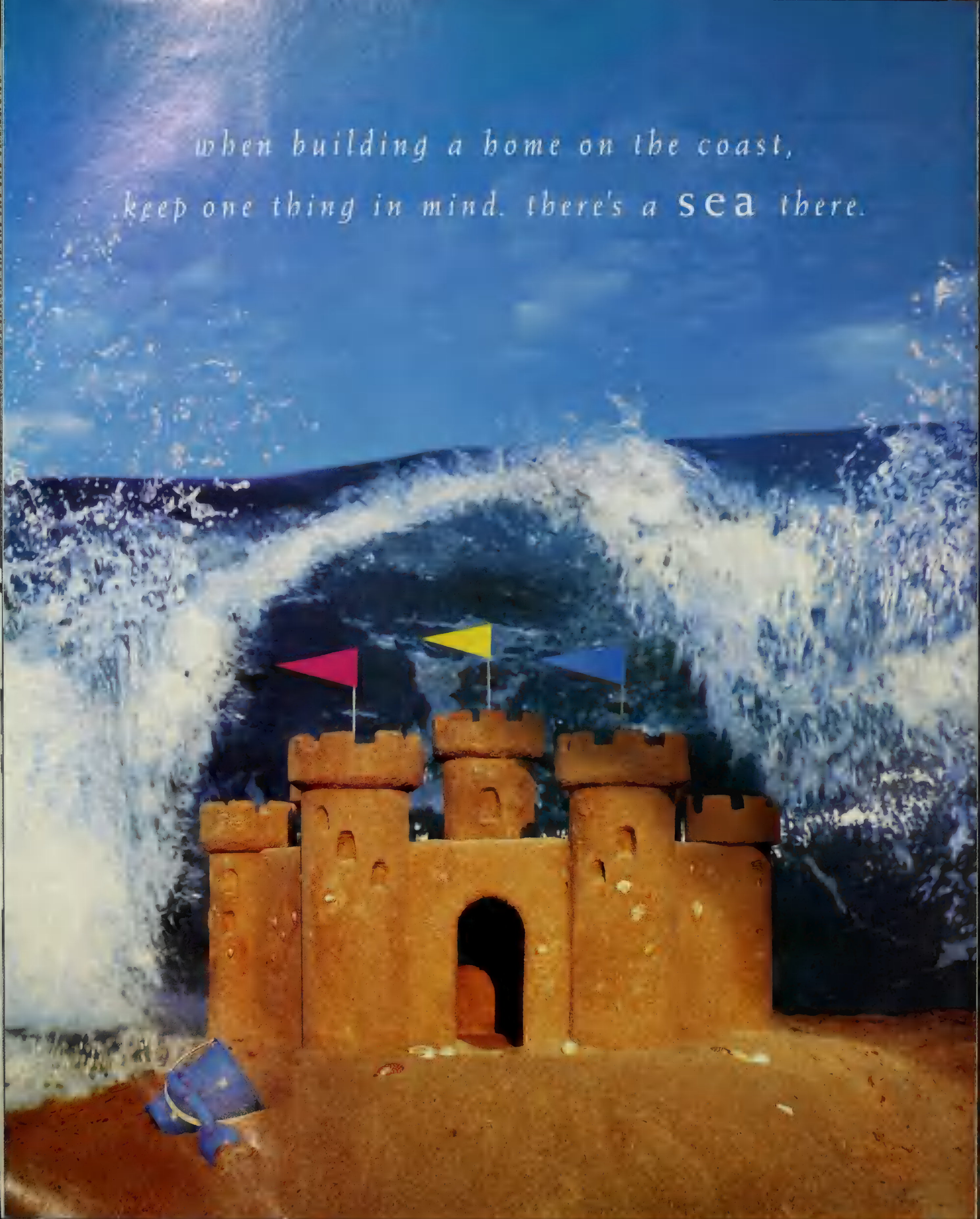
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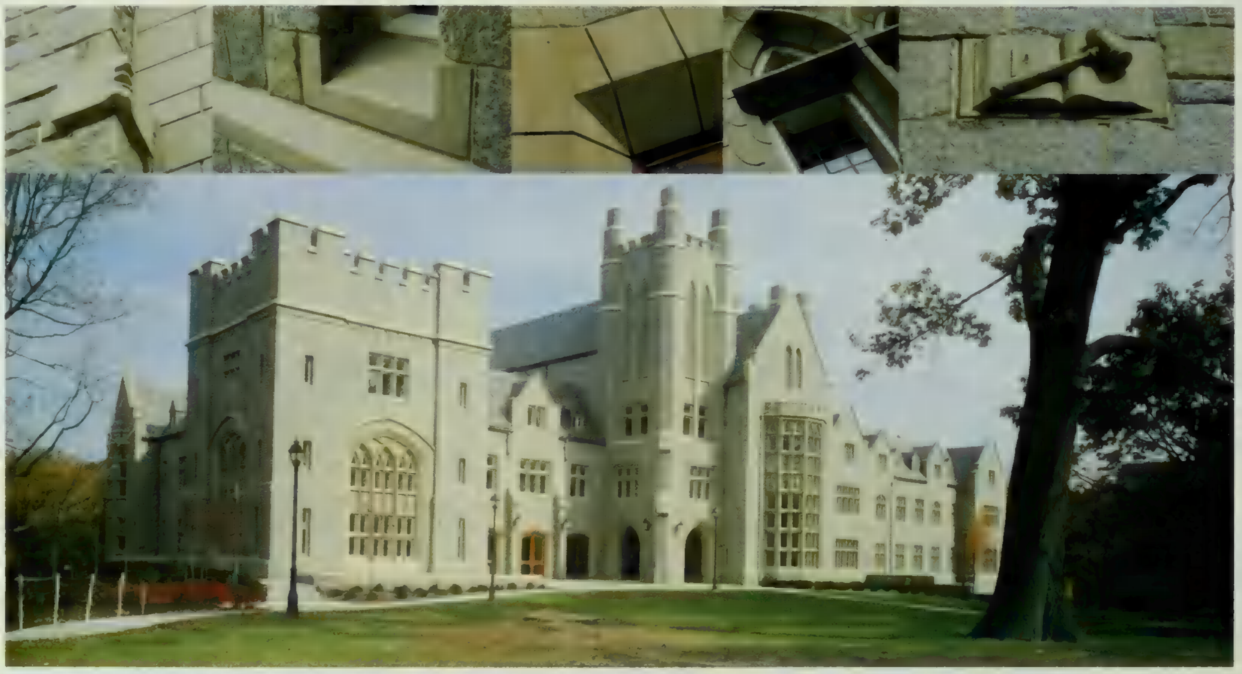

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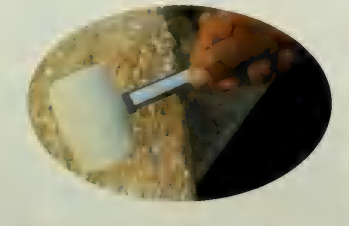

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## DISNEY'S IMAGINEERS GO WILD WITH REALITY-BASED PARK DESIGN

The builders of Animal Kingdom, Walt Disney World's new 500-acre theme park, revised the standard Disney program of having architecture give shape to pure fantasy.

"You have to project real-life experience to get drama," says Joe Rohde, the park's chief designer and a key player at Disney Imagineering, the design house of hypercreative types who, among their many duties, conceive the theme park attractions. To that end, there are allusions in Animal Kingdom to such things as armed poachers and the specter of extinction. They make the fantasy more memorable, Rohde says.

Harambe, an area of the park intended to look like a modern-day East African port town, appears to have been battered by successive tides of history. There is a crumbling fort, a survivor of the Portuguese invasion; an Arabian-style marketplace; and, typical of postcolonial architecture, a whitewashed, reinforced-concrete terrace. A mud brick building is topped with a working satellite dish that has been left unconcealed.

Of course, says Rohde, this is not the sort of authenticity found in museum exhibits. Animal Kingdom is less about reality than the aura of reality, one that is consistent with the popular image of adventuring in the savannah or the jungle. The thatched roofs of the village, for instance, were assembled by Zulu contractors, even though the Zulus (and their roofing technique) are South African, not East African.

The extensive detailing of the colorful wood carvings of the nearby Safari Village suggests that the carvings are imitations of some exotic precedent. They were, in fact, inspired and executed by Balinese artisans, but they were designed by Imagineers to represent a style that is a fusion of South American, Polynesian, and African themes and not specific to any one place.

The buildings of Animal Kingdom were scaled to give priority to the living environment of four million trees and plants representing 3,000 species from six continents. Commanding most vistas are oversize artificial plants, such as the 14-story Tree of Life and a number of wide, faux baobab trees.

Architect Peter Dominick of Urban Design Group and Disney Imagineering have teamed up to plan Animal Kingdom Lodge, a 1,290-room resort hotel complex to be completed outside the park by 2001. Giraffes, antelopes, and gazelles will be able to come within six feet of guests' windows.

Disney wants to do more work like the lodge. Two years ago, the Disney Development Company, the division that employed architects to design hotels and office buildings, merged with Walt Disney Imagineering. Although the merger happened too late to affect Animal Kingdom, Disney executives expect future buildings in the theme parks to have greater architectural integrity, while resorts outside the parks, like Animal Kingdom Lodge, will have more thrills integrated into their design. *David Simon Morton*

**Disney set up the Harambe village to look like an aging port town.**

**POW'S HONORED WITH A MUSEUM** **Andersonville, the notorious Confederate prison camp, was open for just 14 months at the end of the Civil War. But nearly 45,000 Union soldiers were held there, and 12,000 of them died. "There is so much filth about the camp," one prisoner wrote in his diary, "that it is terrible trying to live here." Now the site has a redemptive purpose. In April a museum that honors Americans who have been prisoners of war opened at this national historic site in southwest Georgia.**

**Designed by two Denver-based National Park Service architects, the National Prisoner of War Museum resembles a small prison; visitors enter the 10,000-square-foot brick building through a gated opening between two guard houses. "These buildings and the entry gate constrict the approach to create a feeling of tension," says Carla McConnell, AIA, who designed the museum with her supervisor, G. Rodger Evans.**

**Once inside, visitors are met by streams of natural light, while a central corridor leads to the exhibit areas. "We talked to a number of different former POWs," Evans says. "They told us about the fear they experienced, the isolation, the agony of wanting some kind of resolution. And these were the core themes that we used."**

**Most of the $5.8 million cost of the museum was paid for by private veterans groups, notably the American Ex-Prisoners of War. Former National Commander John Edwards, who was shot down over Germany during World War II and held captive for five months, says the vets "wanted it to be dramatic enough to make the point that life as a POW was not easy. And I think it does that."** ***David Hill***

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# AFTER ANGST-RIDDEN COMPETITIONS, LIBESKIND WILL DESIGN S.F. MUSEUM

Culminating a problematic, years-long selection process, Berlin-based architect Daniel Libeskind has been chosen for what will be his first commission in America, the Jewish Museum San Francisco.

The museum will go up in the Yerba Buena district, with a significant portion of the 70,000-square-foot project housed within the 93-year-old Jessie Street power station.

The architect was chosen based on an interview and on his past work, with his nearly completed Holocaust Museum in Berlin weighing heavily in his favor. The San Francisco museum will be completed by 2001 at a projected cost of $30 million.

Peter Eisenman won the initial competition, but he departed last year after difficulties arose with the museum's new management. In September, three finalists in a second competition—Eric Owen Moss, Studios Architecture, and Enrique Norten—were chosen from a group who had been asked to submit notebooks of conceptual sketches.

Changing direction yet again, the committee decided it wasn't satisfied with its choices and invited Libeskind and the Swiss firm Herzog & de Meuron to enter the competition. Around this time, Norten and then Moss were dropped from consideration.

"Maybe it's not according to Hoyle to bring white knights in at the eleventh hour," says museum director Rabbi Brian Lurie, "but we had only one chance to get this right. It was too important to do it according to whatever is standard procedure."

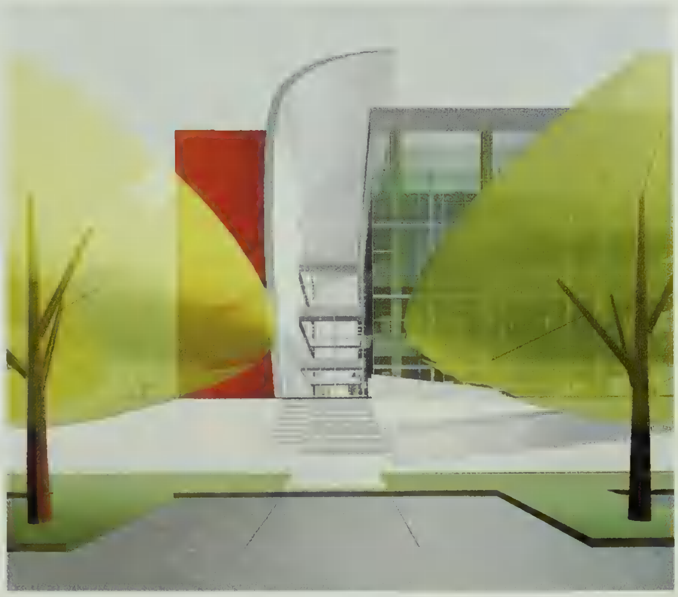
Charles Dilworth of Studios says Libeskind was an excellent choice, but he hopes that the "ultimate outcome is not poisoned by the bungling and cynical manipulation that characterized the selection process." An equally angry Moss says, "If ever there is a discussion of how destructive the process of giving out work can be, I can't imagine a better example than this." *D.S.M.*

**THE PRADO'S MAKEOVER** **To protect the Prado Museum in Madrid during the replacement of its roof, the Spanish construction company FCC designed a remarkable shed. At 100 feet high and 250 feet long, it straddles the entire width of the museum and is mounted on rails that allow it to be moved as work progresses.**

**The project restores the original roofing designed by Juan de Villanueva in 1785 and replaces its underlying structure with modern mechanical services. Dionisio Hernández Gil and Rafael Olalquiaga are the architects behind the restoration, which is part of a larger effort to enlarge and modernize the Prado.**

**After an international competition in September 1996 concluded without a winner, the Ministry of Culture has been advancing slowly, following a program developed by Prado director Fernando Checa. Its main element is a new building for temporary exhibitions, restoration studios, and other services, to be built around a ruined Baroque cloister behind the museum, with an underground connection to the entry hall.**

**In addition, administrative offices and the library were moved to a building behind the museum early this year, freeing space for new galleries, and the Army Museum, which occupies a surviving remnant of the 17th-century Buen Retiro palace, will be taken over to allow the restoration of Philip IV's throne room as decorated by Velázquez.** ***David Cohn***



# THE MURRAH BUILDING'S REPLACEMENT: IN SEARCH OF A SECURE SPACE

Defensible space figures heavily in the plan for a federal campus to replace the Alfred P. Murrah Building in Oklahoma City, where three years ago 168 people died in the worst terrorist attack on American soil. But the design, by Chicago architect Carol Ross Barney, FAIA, of Ross Barney + Jankowski, strives to avoid the impression of a fortress.

Scheduled to open in 2001 and expected to cost at least $25 million, the complex is to be built on three city blocks at the northern edge of downtown. Just to the southeast, on the site of the now-demolished Murrah Building, is a chain-link fence that is a makeshift memorial to the victims of the blast. A permanent memorial consisting of 168 empty chairs, one for each of the victims, will eventually replace it.

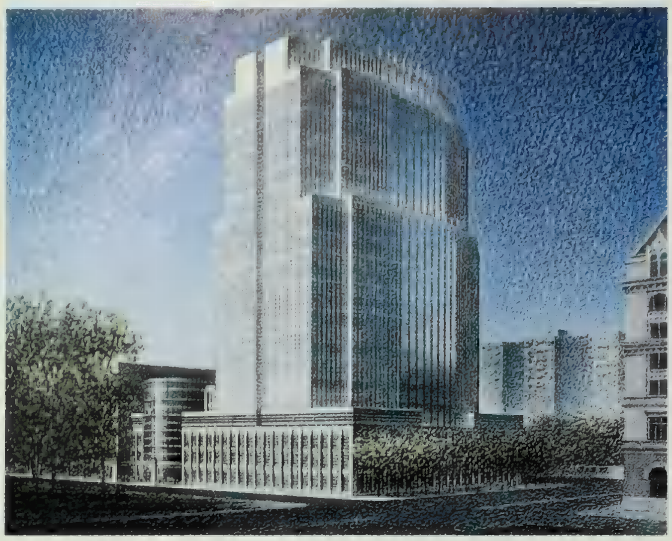
With exterior walls set back from the curb by 100 feet, Barney's scheme is based on federal guidelines that seek to avoid a catastrophic structural collapse like the one caused by a bomb at the Murrah Building.

Barney and her client, the U.S. General Services Administration, concede that no building is bombproof, but they have taken big steps to increase security. To slow or stop an approaching vehicle, the four-story buildings will be raised on mounds and surrounded by boulders. The mounds also are supposed to give office workers the feeling of occupying the equivalent of the military high ground.

For all the safety measures, the design seeks to project an air of normalcy. Tree-lined esplanades on the edges of each block aim to preserve the fabric of the downtown street grid. A curving, 70-foot-tall wall heralds each main entrance, endowing what might have been nondescript office buildings with a sense of monumentality.

Although flying glass accounted for the majority of the survivors' injuries at the Murrah Building, glass will be used as the main facade material for the replacement buildings. In addition to providing an office environment that is light and airy, the material is meant to symbolize the accessibility of government.

If the design wasn't accessible, says GSA chief architect Ed Feiner, it would mean those behind the bombing of the Murrah Building had triumphed: "We didn't want them to win." *Blair Kamin*



## NO SHORTAGE OF BUILDING ACTION IN NEW YORK'S BIGGEST BOROUGH

As New York City celebrates its centennial this year, Brooklyn may resent being overshadowed since its merger with Manhattan. However, the city's most populous borough is taking dramatic steps to create a forceful design presence of its own.

Leading the way is an ambitious plan by the U.S. General Services Administration to update and expand the civic center, which encompasses the 1851 Borough Hall and the nearby public works.

One site that originally housed federal courts and a post office is undergoing a sweeping $130 million renovation designed by R. M. Kliment & Frances Halsband Architects. Much of the space will be converted to bankruptcy courts, while a U.S. Attorney's Office and other facilities will be added and post office retail services will be relocated.

The bulk of the work will be restoration. A multistory atrium with skylights will be reinstated as a center of gravity (below), and many other original decorative elements—down to an unusual orange-ochre paint and wall ornamentations—will reappear.

"The approach was to restore what was restorable," says Robert Kliment, FAIA, adding that additions were designed to stand out as being separate from the original construction, which dates to 1892. Among the additions is a new flight of steps, to be built along the western wall; a mezzanine, which will be added to the 1933 extension to allow for a view of the older site; and office space, to be placed on the top.

Across the street sits an empty lot where a new, 750,000-square-foot federal courthouse designed by Cesar Pelli is slated to open in the year 2000 (above). The 18-story tower will be connected to the existing six-story courthouse via a connecting entry hall.

Downtown isn't the only place getting attention. The waterfront from the Manhattan Bridge to Brooklyn Heights, comprising 75 acres mostly owned by the state, is lying fallow. A plan to turn it into a mixed-use, self-funding park has been pending for years, though developer David Walentas also has designs on the site. *Soren Larson*

## AFTER A DRAMATIC DISPLACEMENT, HUNGARY GETS NEW NATIONAL THEATER

The curtain went up on the first act of Hungary's new National Theater on April 1, when ground was broken for the 300,000-square-foot structure in Budapest's city center. The first performance is scheduled for October 23, 2000—the 44th anniversary of the Hungarian uprising against the Soviet-dominated regime.

The National Theater hasn't had a permanent home since 1965, when the grandiose building it had occupied for 54 years was demolished to make way for a transportation center. It was forced to move to a nondescript, Socialist-style structure away from the central area.

Now it will be housed in a multilevel building—the stepped design ranges from 10 to 13 stories—being erected on 54,000 square feet of an 85,000-square-foot plot, with the remaining space to be a park.

The design includes three performance areas on different levels: a grand theater seating up to 650; a studio theater accommodating up to 200; and an outdoor amphitheater-like facility that will serve variously as a playground and a venue for street performers and other artists.

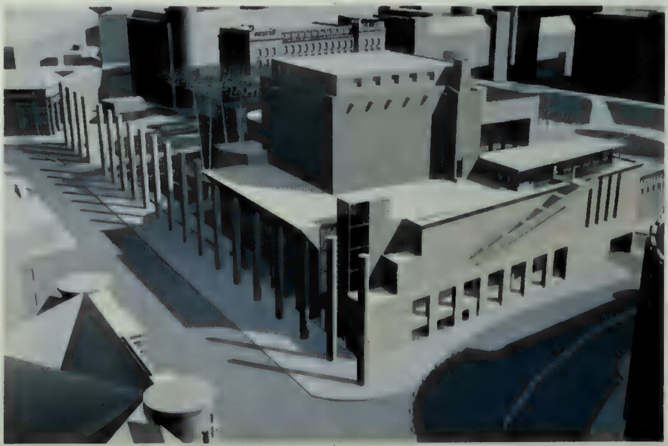
"The building is multifaceted," says István Fiala, an architect and the government commissioner for the theater. "It will be fronted by 19 freestanding columns, each 30 meters high, and will have a fully enclosed glass-and-steel entry hall."

The design, by architect Ferenc Bán, who lives and works in Nyîregyhéza, in northeast Hungary, was selected early last year by a jury of 12 Hungarians. Bán—who picked up the equivalent of $30,000 for his efforts—describes his design as incorporating "the timelessness of a castle with floating steel structures and spaces delineated by glass, suggesting lightness."

A number of architects who participated in the competition didn't take it lightly when the jury, after selecting the winner, chose only 16 of the submitted designs for public viewing last May. They complained to the Ministry of Culture and Education, which calmed them down by staging an exhibition of all the submissions four months later.

The new theater will likely cost around $71 million. The national government, Fiala reported, has allocated about $38 million. In addition, $11.9 million in private donations, earmarked exclusively for a new theater, has been held in state banknotes since 1983.

Fiala hopes that multinational corporations doing business in Hungary, along with wealthy individuals, will contribute and become sponsors of the theater. *Carl Kovacs*



PHOTOGRAPHY: © R. M. KLIMENT & FRANCES HALSBAND ARCHITECTS (BOTTOM LEFT); CESAR PELLI & ASSOCIATES (TOP LEFT); FERENC BAN (RIGHT)

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CIRCLE 21 ON INQUIRY CARD

## U.S. AND MEXICAN STUDENTS BRAINSTORM FOR A FRIENDLIER BORDER CROSSING

NAFTA has helped goods flow freely across the border between the U.S. and Mexico, but people still can't help feeling less than celebratory when they pass through the oppressive, concrete-and-asphalt port of entry for San Diego and Tijuana.

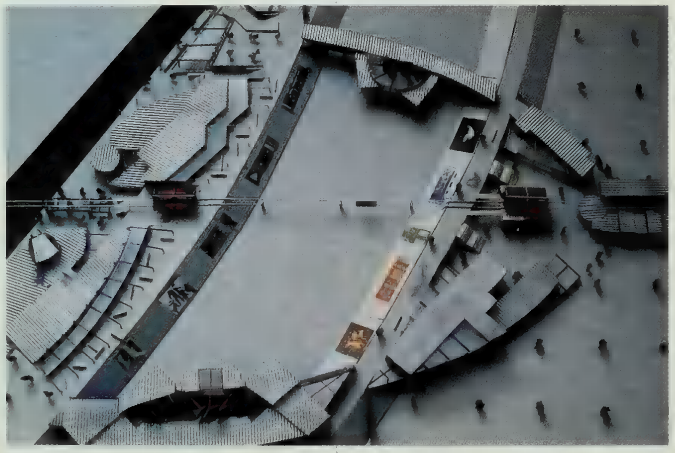
To counteract this deflating situation, California Polytechnic State University's Pomona campus invited architecture students on both sides of the border to design a friendlier, more welcoming border crossing for pedestrians. The program for *La Puerta* (The Door) included a bicultural arts center and library, a plaza, social services agencies, and guarded checkpoints.

The proposals, which were exhibited in San Diego this spring, reflected the participants' experiences with the border. One Cal Poly student, Hector Rochin Gaxiola, seemed to compensate for today's poor border relations with festive vernacular buildings (below).

Students from Universidad Iberoamericana Noroeste in Tijuana tackled the frosty reception Mexicans sometimes experience when traveling north by designing a complex that would straddle and thereby "erase" the border.

From afar, Universidad Iberoamericana students in Mexico City produced the most formal solutions. Their *Engranes* (Gears), which is linear in plan, would invite people to crisscross the line at will through interlocked building segments.

Overall, the common theme of the projects was to build a civic plaza to encourage interaction and replace a forbidding no-man's-land. *Ann Jarmusch*



## SAFETY FIRST: L.A.'S CITY HALL GETS PREPARED FOR EARTHQUAKES

Following decades of earthquake damage, the Los Angeles City Hall is set to receive major repairs— just in time to mark the building's 70th anniversary. The building is undergoing a seismic rehabilitation to make it safer when the earth starts to move, while other improvements will bring it up to current fire, life safety, and disabled-access codes.

Rising 32 stories and with a footprint of roughly 750 by 350 feet, the City Hall sits in L.A.'s geographical center. Its bulk and distinctive profile, as well as its civic function, make it an enduring landmark. Designed by architects John C. Austin, Albert C. Martin, and John Parkinson, the building was dedicated in April 1928; Martin's successor firm, AC Martin Partners, designed the present rehabilitation.

AC Martin's plans call for "base isolation" seismic construction so that the building can remain stable even when the ground shakes beneath it. The steel-frame building's 430 structural columns will be uncovered a few at a time, and each will be retrofitted with a layered steel and rubber isolator attached above its footing.

In addition, a four-foot-wide separation joint will be constructed around the building's perimeter. As a result, the structure will remain independent of the ground motion during seismic activity, with the base of each column able to move up to 12 inches without the transfer of major forces into the building. When repairs are completed, the City Hall will be the world's tallest base-isolated structure.

Although seismic upgrade is the primary focus of the $180 million being spent on improvements, more visible to the public will be the restoration of historical areas, such as the City Council and Public Works Chambers, and of the building's exterior. Decorative ceilings, marble columns and floors, and damaged terra-cotta cladding will be restored or replaced.

As downtown welcomes new works by Frank Gehry and José Rafael Moneo, Angelenos will also be able to walk through the old City Hall with pride and enjoyment once more—this time with an added sense of safety. *Alice Y. Kimm*

**FRENCH COMPETITIONS IN QUESTION** **France may be in hot water with the European Commission over what some see as a pattern of unfair awarding of public service contracts. After securing the cancellation of several architectural competitions involving irregularities in a case in 1995, the EC subsequently received additional complaints concerning various competitions organized by the general council of Réunion, a French island near Madagascar. As a result, in April the EC announced its decision to send the French government a reasoned opinion—which is the second stage of infringement proceedings—for the breaching of European Community rules that govern the opening of public service contracts to competition.**

**In the four contested competitions, two winners have links with jury members, in breach of an article which stipulates that the jury must be independent. In another scenario, the contracting authority rejected certain candidates on the grounds that they had not been selected in earlier procedures, which contradicts a requirement that selection criteria must be clear beforehand. Finally, one of the projects selected turned out to be incompatible with the land-use plan and was subsequently revised, in breach of the principle of equal treatment of competing designs. The French authorities are called upon to terminate the award procedures in question and take necessary steps to ensure that competitions in Réunion are just that: competitive.** ***W. B. Schatzman***

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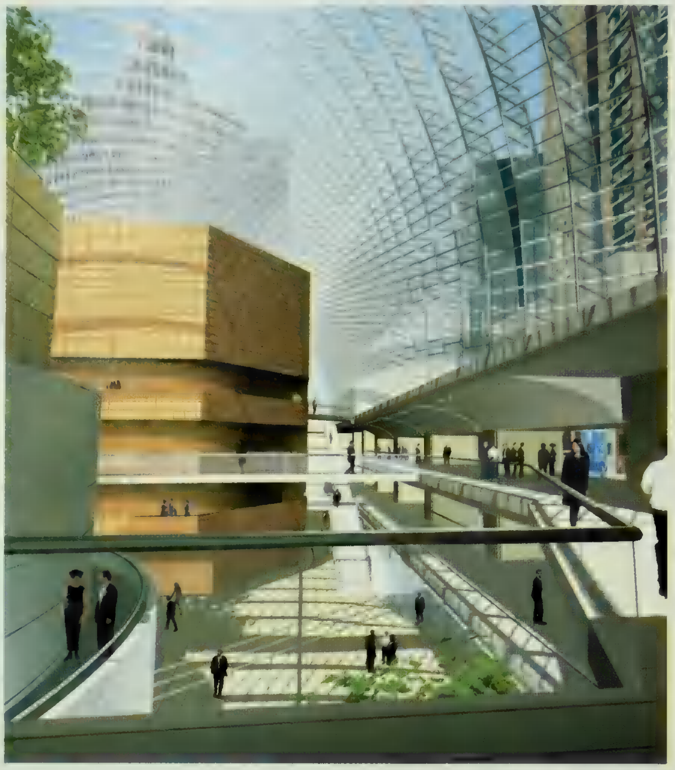
CIRCLE 22 ON INQUIRY CARD



## VINOLY'S NEW PHILADELPHIA STORY IS ABOUT OPENNESS AND INCLUSION

In designing the new Regional Performing Arts Center in Philadelphia, Rafael Viñoly wanted to do away with traditional notions of a confined lobby and an aura of exclusion. "It was more of a notion of creating and extending a public space," he says. "I didn't want it to be so closed off, so uninviting."

The solution was to drape an arched envelope of glass with steel supports over the performance spaces, creating an environment that the architect says is protected but still open and filled with natural light.

Groundbreaking for the new 435,000-square-foot center, located on the corner of Broad and Spruce Streets in the downtown area, will be in November; completion is set for 2001.

Inside will be a 2,500-seat concert hall in the shape of a cello that will be home to the Philadelphia Orchestra, as well as a 650-seat recital space with a stage on a turntable, which allows one act to set up or rehearse while another faces the audience.

Theater designer Richard Pilbrow worked on the interiors and acoustician Russell Johnson created the sound environment. The cello shape is not just symbolic or decorative but in fact is said to be conducive to first-rate acoustics for classical music. *S.L.*

## A GIANT NEW MALL IN PROVIDENCE SITS ON BOTH SIDES OF THE TRACKS

The problem, as co-architect Friedrich St. Florian puts it, was to put a New York–size building into the center of a delicately scaled New England city of 150,000.

The solution for 1.35 million-square-foot Providence Place, a mall taking shape in the center of the Rhode Island capital, was to design it not as a building but as a city block. Each section has a different facade (designed within a set of unified criteria) and often a different architect. The mall will also have numerous entrances, as well as many on-street restaurants and shops.

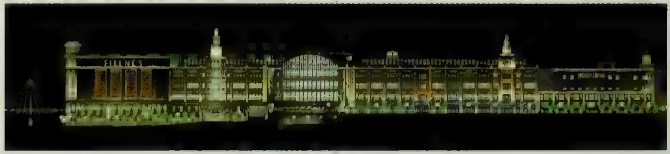
The project is also momentous in that it connects two sections of Providence split by the Woonasquatucket River and the railroad tracks. A glass-enclosed, arched-roofed wintergarden forms a bridge over the river and the railroad, connecting the two halves of the mall and at the same time breaking down its volume.

Unlike big-box malls that have often siphoned urban life into the suburbs, Providence Place is intended to draw people into the downtown area, where they might otherwise never go. A few blocks away is the 1828 Providence Arcade, which locals say is probably the oldest enclosed shopping street in America.

City officials hope that the arcade and other small stores will not only survive the new mall but prosper from the influx of visitors to the area, as happened in Boston after the construction of Copley Place.

Arrowstreet Inc. of Somerville, Massachusetts, was responsible for the interior public spaces and construction documents; St. Florian of Providence was in charge of exterior elevations; HOK Architects of St. Louis and Callison Architecture of Seattle designed the three department stores (with the help of 24 public workshops); and the developer is Commonwealth Development Group.

The $430 million project—which is bigger than the entire Brown University campus, located nearby—is scheduled to be completed in August 1999. *Jonathan Hale*



**SHARED SENSIBILITIES** **Architect Ron Petralito wasn't after a commission when he contacted the author of an article about co-housing. The self-described "back-to-the-woods kind of guy," who'd done a stint in a communal arrangement in his younger days, just liked the idea of group living. As a single father, he hoped the co-housing concept would provide a support network for him and his son.**

**In co-housing, a Danish import, individuals and families maintain their own homes but share cooking, meals, and clean-up in a communal dining room. American architects Kathryn McCamant and Charles Durrett spent a year in Denmark studying co-housing communities, and their book, *Co-Housing: A Contemporary Approach to Housing Ourselves,* introduced the idea to the United States.**

**Since 1991, 36 co-housing projects have been constructed nationwide and over 150 more are in the planning stage, according to Ann Zabaldo, regional coordinator for the Co-Housing Network. The concept strikes a chord in a variety of people, she says. Some are looking for a support network of similarly minded souls; families in which both parents work like the idea of coming home to a waiting supper. While co-housing is not to be confused with assisted-living facilities, it encourages the kind of helpfulness that enables many elderly to remain independent.**

**Petralito liked what he saw enough to join a co-housing group planning to live in Libertytown, Maryland. Fellow members called on his design expertise, and the IIT grad eventually became the project architect. They're ready to break ground, according to Zabaldo, as soon as financing is completed. *Ellen Sands***

DERINGS: © RAFAEL VIÑOLY ARCHITECTS (PHILADELPHIA); ARROWSTREET GRAPHIC DESIGN (PROVIDENCE)

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CIRCLE 23 ON INQUIRY CARD

## REVAMPING EFFORT GETS UNDER WAY AT HISTORIC SOUTH AFRICAN COLLEGE

Phase one of an ambitious effort to rehabilitate and enlarge Wilberforce University, the first American-funded college in South Africa, has just been completed, with groundbreaking for phase two, a new academic building core, slated to begin in August.

For architect William Stanley, FAIA, whose Atlanta-based firm, Stanley Love Stanley, has been involved in the project since 1996, the undertaking provides "an opportunity to be on the ground floor of something so significant to the future of South Africa—the effort to provide quality education to black South Africans."

Wilberforce University was established in 1908 in Evaton, just outside Johannesburg, by the African Methodist Episcopal Church and developed gradually over the next five decades. In its prime the university educated many of Africa's leaders; in the 1960s, though, the school was closed by the government, largely because of the role students played in organizing protests against apartheid.

The university's 13 core historic buildings, primarily stucco and brick with metal roofs, have been restored to their original Flemish and N'Debele (a people of northern South Africa) styles, in a process that was fast-tracked to be completed in time for President Clinton's visit to South Africa this past March.

The second phase will consist of a classroom; an administration and library complex; a modest conference center; and additional academic buildings. Once funding is secured, phase three, a "distance learning center," will begin construction some time next year.

Funds are coming from a grant by USAID-ASHA (American Schools and Hospitals Abroad), part of the U.S. State Department, as well as from private donations.

The design work was done by Stanley Love Stanley in collaboration with M. Peter Malafane, the first black architect trained in South Africa, to maintain consistency with the local architectural vernacular.

Stanley Love Stanley's campus plan is organized around a central quadrangle whose axis extends from the original campus quadrangle. The design was made to be flexible, Stanley explains, to allow for future enhancements, which could include additional academic buildings, housing, a research center, and facilities for local government, a performing arts complex, and retailers. *Julie Moline*

PHOTOGRAPHY: © STANLEY LOVE STANLEY

# GWATHMEY HEADS FOR HOME TO DESIGN NEW ART MUSEUM FACILITY

He's already done the Guggenheim Museum addition in New York and the Henry Art Gallery at the University of Washington. Now Charles Gwathmey is turning his attention to the St. John's Museum of Art, a small but regionally respected institution in Wilmington, North Carolina, that is building a new facility. "I pursued it even though it's a small job for us because I do have a legacy [there] that's important," says Gwathmey.

Born in Charlotte, Gwathmey spent his first 18 summers at Wrightsville Beach, near Wilmington. More important, his father, the artist Robert Gwathmey, and his mother, Rosalie, a photographer, were close friends of the Wilmington artist Claude Howell, a longtime supporter of the St. John's Museum who died in 1997.

The museum has outgrown its patchwork of 19th- and 20th-century buildings in downtown Wilmington (at left in photo, next to the 1804 St. John's lodge), says director Ren Brown. Gifts last fall of $4 million from the Bruce B. Cameron Foundation and five acres of land from the children of Louise Wells Cameron, a museum patron who also died in 1997, enabled the museum to plan a new 30,000-square-foot facility.

The new site, at the intersection of two major arteries outside of downtown, offers an opportunity for the sort of art museum that doubles as a work of art, Brown says.

"I would certainly think we're going to build the most significant building in Wilmington in the 20th century," says Brown, noting "not much competition" in a town known for 19th-century-and-older buildings.

"I think what a building like this should do is in a sense make a compelling architectural object that engages people's curiosity and also is memorable in the most positive way," says Gwathmey, who hopes to present initial designs soon.

Construction could take another two years. In the meantime, the museum must raise the balance of the expected $7 million cost—a goal that will be easier to achieve now that Gwathmey is involved, says Brown.

St. John's is one of several area art museums that are building or considering an expansion. The state-owned North Carolina Museum of Art is seeking funds to expand and refurbish; the Mint Museum of Art in Charlotte is renovating a downtown building as a crafts museum; and Reynolda House in Winston-Salem has hired Beyer Blinder Belle to design additional space. *Chuck Twardy*

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CIRCLE 24 ON INQUIRY CARD

## NEWS BRIEFS

**Ellerbe Becket suit settled** The litigation between Ellerbe Becket and the Justice Department was settled in late April when the two parties agreed to a compromise of disputed claims. Justice had alleged that Ellerbe Becket was not designing its sports facilities according to Americans with Disabilities Act rules, though the firm claimed that its constructions provided proper elevated sightlines for wheelchairs, and that the ADA was unclear. In the end, Justice published a standard volume called "Accessible Stadiums" to set criteria; Ellerbe Becket incurred no civil penalties and agreed to use the new guidelines.

**AIA gets go-ahead** At the AIA's national convention in San Francisco last month, delegates voted in favor of a proposed multimedia ad campaign—an effort intended to boost the image of the architecture field. Members will be charged $50 a year in order to extend the current print effort to include network and cable television, along with radio. In addition, Ronald L. Skaggs, FAIA, was named the 1999 first vice president/president elect. He will become president of the AIA in 2000; Michael J. Stanton, FAIA, will succeed Ronald Altoon, FAIA, as president next year.

**The Postal Service's homage.**

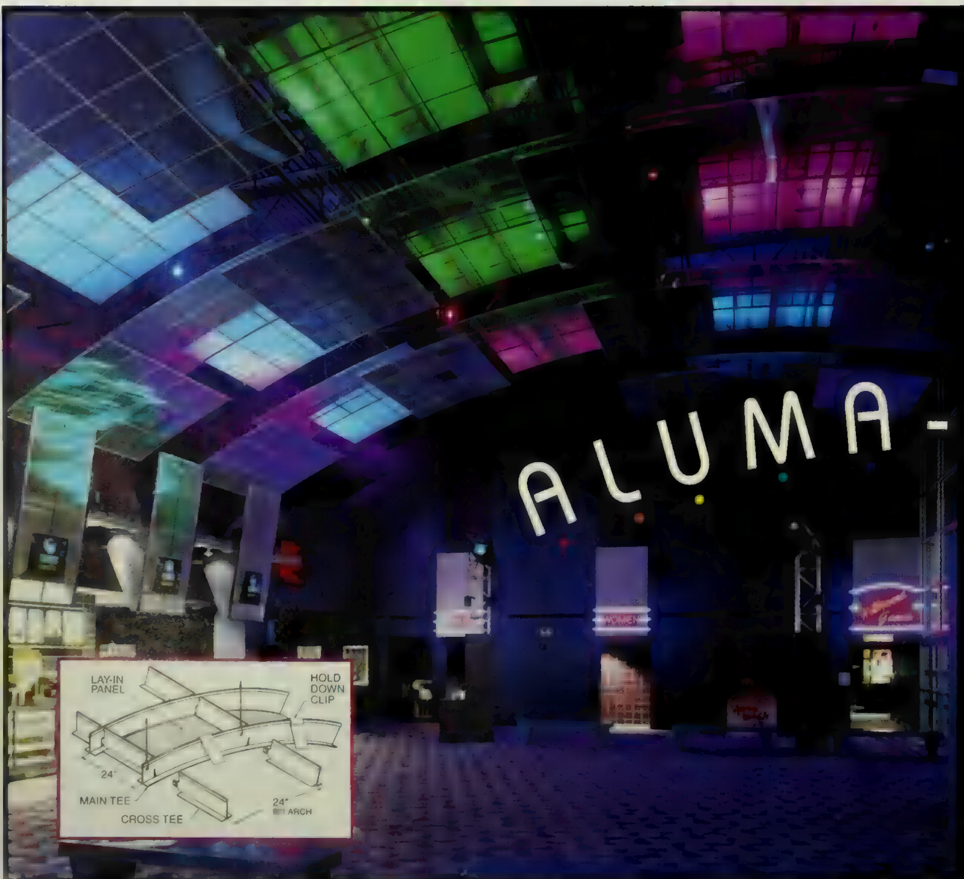
**Stamp of approval** Art Deco has been recognized by the U.S. Postal Service. Late in May, a stamp featuring the Chrysler Building's spire began circulating. It is being offered on a sheet commemorating the Roaring Twenties.

**Not the old school** Avon, Indiana, will soon be home to a $65 million high school. Designed by Fanning/Howey Associates, the facility, which will sit on a 104-acre site outside Indianapolis when it's completed in August 1999, will feature five baseball fields, a football field and four practice fields, two soccer fields, and 12 tennis courts for this sports-crazy state. Avon High School will also have 91 teaching stations or classrooms, organized in "academic houses" comprising four classrooms and one science lab per house.

**In a White room** In 1902, Payne and Helen Hay Whitney thought it a splendid idea to have Stanford White create an opulent reception room for the Fifth Avenue townhouse he was designing for them. The result was the Venetian Room, which welcomed swells until 1948, when it was painstakingly dismantled and moved to Long Island. In 1997 the family donated the room to the French-American Foundation—which happens to reside in the original 1902 house. The foundation reinstalled the room and now displays it for those interested in a glimpse of the Gilded Age.

**Miele digs Graves** First Michael Graves appeared in an ad for a Miele dishwasher in 1994. Now the architect has furthered his relationship with the international appliance company by designing its new U.S. headquarters in Princeton, New Jersey. Ground was broken in April and the 31,400-square-foot facility should be occupied early next year.

**Danger zone** The State of New York's Protecting Home & Family program, which was created to educate architects and others about protecting residences against



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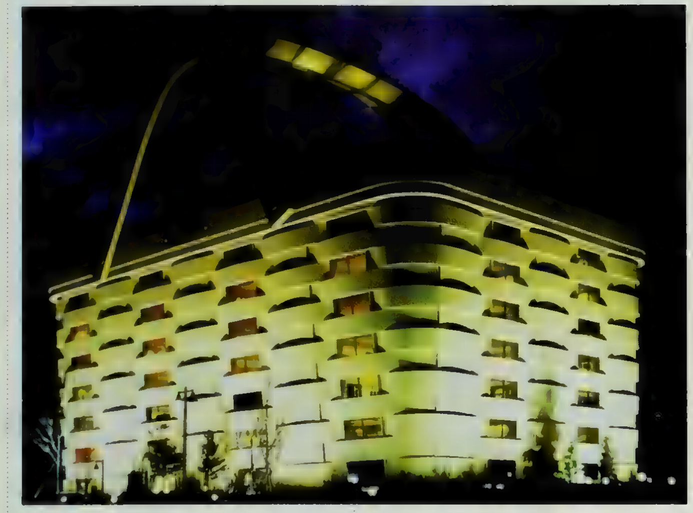
CIRCLE 25 ON INQUIRY CARD

natural menaces such as hurricanes, is building a hazard-resistant model home. Located at SUNY Maritime College in the Bronx, the project will be a training center and an example of the latest techniques in weathering natural disasters.

**Basket case** The Longaberger Co., the largest manufacturer of handmade baskets in the U.S., has completed construction of its new headquarters in Newark, Ohio. Rather than go with a standard office building, the company created a monument to its bestseller by designing the structure to resemble a huge basket—160 times the size of the Medium Market Basket, to be exact. Longaberger designed the exterior and interiors.



**Longaberger's new office will be built to resemble its top-selling product.**

**Predock gets another** Antoine Predock—who recently designed Skidmore College's art museum—has been selected as architect for the Tacoma Art Museum's new 50,000-square-foot building. Groundbreaking is set for mid-1999 for the museum, which will be Predock's first project in the Northwest.

**Not that Alhambra** Most people don't think of New York's Bedford-Stuyvesant area when they hear the word *Alhambra*. But Spain isn't the only place to find one; on Brooklyn's Nostrand Avenue there stands an 1889 Queen Anne Revival apartment building with that name. The landmark building is being renovated by architect and preservationist Tom Anderson and will soon house 46 apartments as well as 7,000 square feet of retail space.

**Doing their homework** Students in the University of Oregon's Urban Architecture program have some real projects on their hands. They're designing a Hispanic center and helping adapt a post office in downtown Portland. Free of charge, of course.

**Peter, historian; Mann, architect** John Peter, a longtime magazine consultant and art director who recorded oral histories of many of this century's top architects, died in May at age 81. He was the author of several books, including his latest, *The Oral History of Modern Architecture,* an encyclopedic volume published in 1994.

Arthur Edwin Mann, FAIA, a founder of the Los Angeles–based Daniel, Mann, Johnson & Mendenhall, died in late April. He had gone from selling drawings during the Depression to building one of America's largest architectural firms, which has done extensive work in public transportation. ■

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CIRCLE 26 ON INQUIRY CARD

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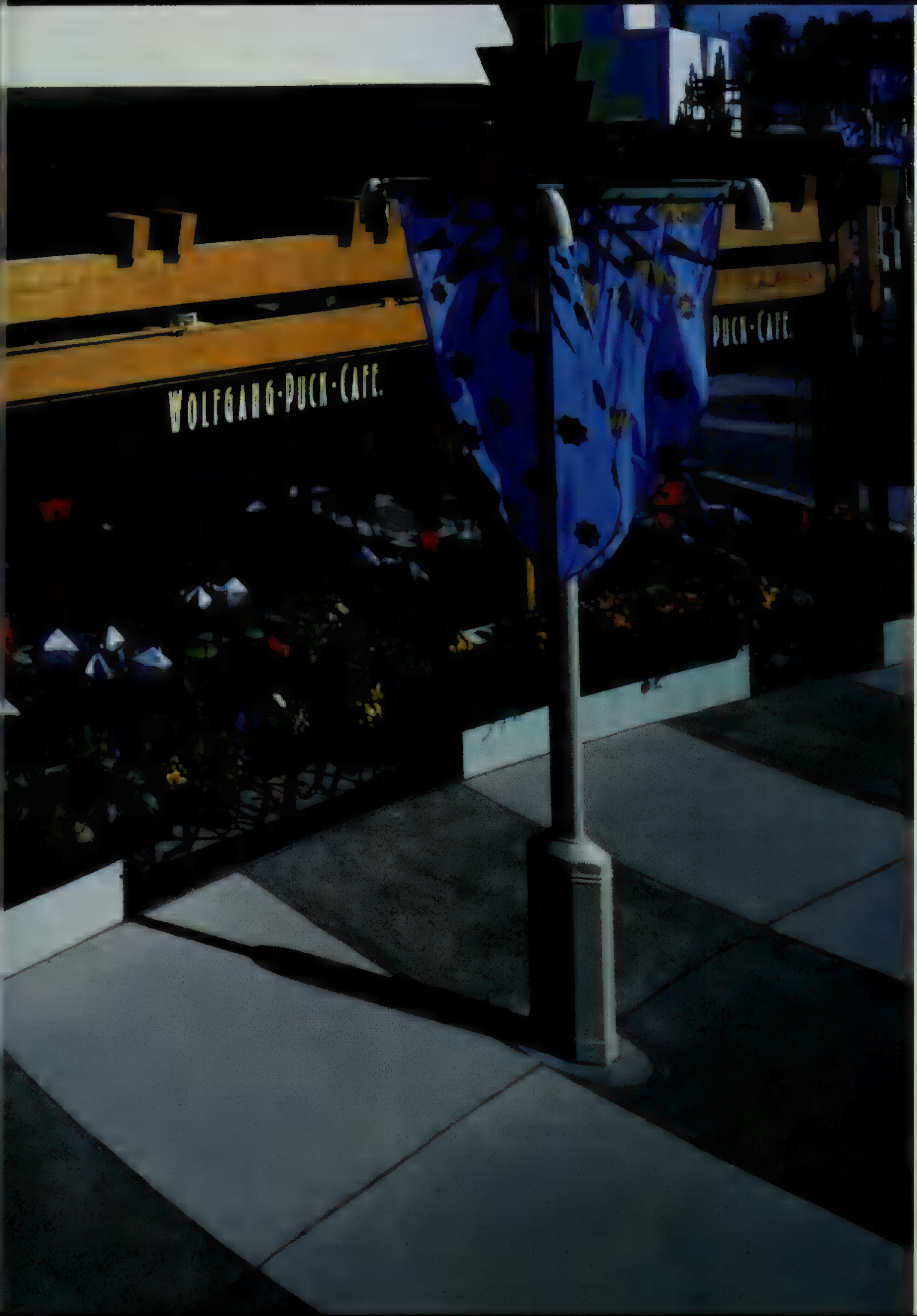

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**CIRCLE 27 ON INQUIRY CARD**

# DATES EVENTS

## Calendar

**Kisho Kurokawa Retrospective**
**London**
*Through June 13*
"From the Age of the Machine to the Age of Life" is a major retrospective of the work of Japanese architect Kisho Kurokawa, from his early projects with the Metabolist Group to his current addition to the Van Gogh Museum in Amsterdam. RIBA Architecture Centre. 011/01-1-580-5533.

**Philippe Starck Exhibition**
**Miami**
*Through June 14*
Housewares, lamps, furniture, flatware, books, and other objects by the celebrated and controversial designer are on display. Arango. 305/661-4229.

**Maya Color: The Painted Villages of Mesoamerica**
**Washington, D.C.**
*Through June 26*
Paintings and photographs by Jeffrey Becom and Sally Jean Aberg explore the symbolism of color in ancient and modern Mayan architecture. AIA Headquarters Gallery. 202/638-3221.

**Finnish Modern Design: Utopian Ideals and Everyday Realities**
**New York City**
*Through June 28*
Featured in this exhibition are glass, ceramics, furniture, textiles, metalwork, and industrial design. Organized by the Bard Graduate Center for Studies in the Decorative Arts in New York and the Museum of Art and Design in Helsinki. Bard Graduate Center. 212/501-3000.

**Titanium!**
**New York City**
*Through June 30*
An exhibition demonstrating the range and diversity of titanium, including its recent architectural applications in the Guggenheim Bilbao and elsewhere. Material ConneXion Gallery. 212/445-8950.

**Architecture in Perspective**
**Washington, D.C.**
*Through July 5*
This juried exhibition, organized by the American Society of Architectural Perspectivists, features 55 renderings, including the six winners of the Hugh Ferriss Memorial Prize. The Octagon. 202/879-7764.

**Changing Places: Looking at Southampton**
**Southampton, New York**
*Through July 12*
Paintings, maps, plans, and photographs document Southampton sites and how they have changed over time. The show explores issues of village planning, land use, and demographic change. Parrish Art Museum. 516/283-2118.

**The City as Memory: International Sculpture**
**Chicago**
*Through July 12*
Sculpture and other artworks created by artists from Europe, Asia, and North and South America. Chicago Athenaeum Museum of Architecture and Design. 312/251-0176.

**Architecture of Independence: Making of Modern South Asia**
**Pittsburgh**
*Through July 19*
The work of four South Asian architects—Charles Correa, Achyut Kanvinde, Balkrishna Doshi, and Muzharul Islam—is included in this traveling exhibition. Heinz Architectural Center, Carnegie Museum of Art. 412/622-3131.

**A New Campus Center: The IIT Competition Results**
**Chicago**
*Through July 25*
A show of materials submitted by the five finalists in the competition to build a new campus center for the academic complex designed largely by Mies van der Rohe. The exhibition includes work by Peter Eisenman, Zaha Hadid, Helmut Jahn, Kazuyo Sejima and Ryue Nishizawa, and Rem Koolhaas, who won the commission for the campus center. Art Institute of Chicago. 312/443-3600.

**Landmarks of New York**
**New York City**
*Through August 23*
An exhibition of historical photographs marking the 100th anniversary of New York City, accompanied by a symposium, walking tours, and panel discussions. New-York Historical Society. 212/873-3400.

**The Inflatable Moment: Pneumatics and Protest in '68**
**New York City**
*Through August 29*
An exhibition focusing on the French architects and activists Utopie. Also on display are models by Archigram, Frei Otto, Gernot Nalbach, and Coop Himmelblau, as well as structural fragments of built pneumatic projects. Architectural League of New York. 212/753-1722.

**National Design Triennial**
**New York City**
*Through September 12*
A survey of developments in contemporary design, investigating how issues and ideas drive design practices in America. Cooper-Hewitt National Design Museum. 212/849-8300.

**Completing the Federal Triangle**
**Washington, D.C.**
*Through September 27*
An exhibition documenting the development of the Ronald Reagan Building and International Trade Center on Pennsylvania Avenue, starting from a design competition in 1989 and culminating with the building's recent completion. The winning design was by Pei Cobb Freed & Partners in association with Ellerbe Becket. National Building Museum. 202/272-2448.

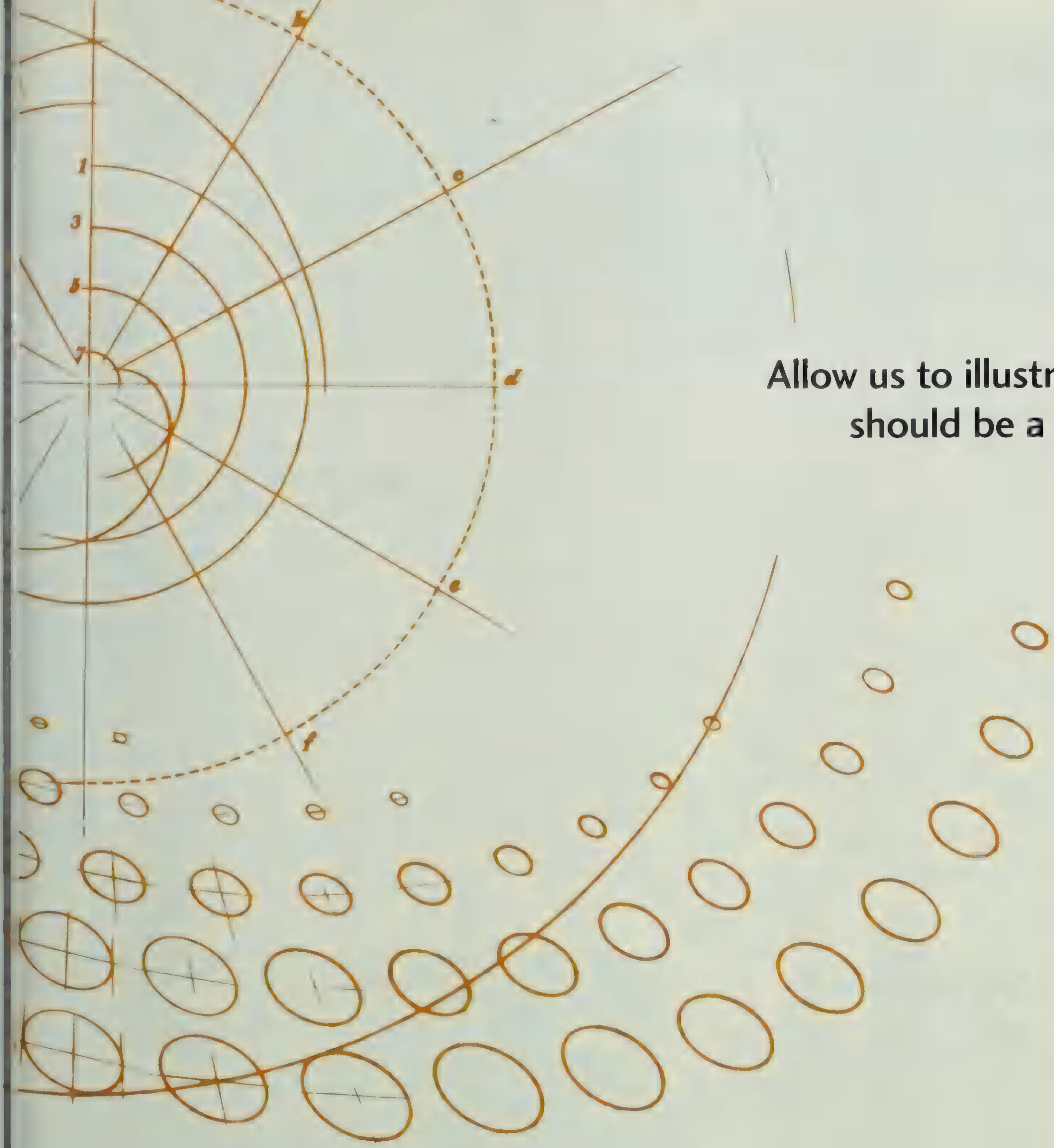
**Shifting Gears: In Pursuit of a Greener City**
**Toronto**
*Through September 27*
An exhibition proposing urban design strategies for reducing carbon dioxide emissions. Design Exchange. 416/216-2145.

**The Design and Building of Girard College**
**Philadelphia**
*Through October 23*
Surviving entries in the 1832 design competition for the college, the first architecture competition to attract nationwide attention, will be on display, as well as drawings of the construction of the winning entry, completed in 1848. Founder's Hall. 215/787-2601.

**New Ways of Revitalizing the American City**
**Washington, D.C.**
*Through January 3, 1999*
An exhibition illustrating how new cultural facilities have brought life back to tired downtowns in Phoenix; Cincinnati; Fort Worth; Newark, New Jersey; San Jose, California; and Kansas City, Missouri. National Building Museum. 202/272-2448.

**Cities on the Move 2**
**Bordeaux, France**
*June 4–August 30*
This collaborative exhibition put together by artists, architects, filmmakers, and other "creators" explores the shapes and forms of Asian cities. Musée d'Art Contemporain. Call 011/33-05-56-52-78-36 or E-mail capc@mairie-bordeaux.fr for details.

**The Business of Innovation: Bechtel's First Century**
**Washington, D.C.**
*June 5–January 4, 1999*
A portfolio of some of the 14,000 projects that have been completed by San Francisco–based Bechtel Group, one of the world's largest engineering and construction firms.



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Highlighted "megaprojects" include the Hoover Dam, the Marinship shipyard, San Francisco's rapid transit system, and the Channel Tunnel, connecting England and France. National Building Museum. 202/272-2448.

**Japan 2000: Design for the Japanese Public**
**Chicago**
*June 6–September 7*
An exhibition of recent winners of Japan's G-Mark, an annual awards program sponsored by the government, which promotes good design. On display are such winning products as Casio G-Shock watches, Yamaha bicycles, and mini automobiles. Art Institute of Chicago. 312/443-3600.

**NeoCon '98**
**Chicago**
*June 7–10*
The world's largest trade show for interiors will incorporate the Buildings Show, featuring building products and facilities management services; DECOREX, a high-end furnishings show; Office Expo/BPIA, with a full spectrum of office furnishings; *NEW* Hospitality, featuring products for restaurants, bars, hotels, and clubs; and TechnoCon, featuring CAD solutions for interior design. Merchandise Mart. 800/677-6278.

**The New Toronto and Envirofest '98**
**Toronto**
*June 8–10*
The first two days of this convention will feature lectures on adaptive reuse, infill, regulatory reform, transportation, and infrastructure and their predicted impact on Toronto's future. Envirofest '98—an exhibition showing how available building products, furniture, interior furnishings, and services contribute to environmental sustainability—will take place on the third day. Design Exchange. 416/216-2124.

**Forma Italia**
**Chicago**
*June 8–September 6*
The opening of this exhibition of Italian furniture, lighting, and industrial design coincides with NeoCon '98 (see above). On display are objects from the permanent collection of the Chicago Athenaeum Museum of Architecture and Design, as well as several new pieces that were introduced this past April at Milan's Salone del Mobile. Chicago Athenaeum Museum. 312/251-0176.

**Fountains: Splash and Spectacle**
**New York City**
*June 9–October 11*
This exhibition elucidates the role of European and American fountains—and water as a design force—in defining urban space, with examples ranging from the Renaissance to the present. Cooper-Hewitt National Design Museum. 212/849-8300.

**RAIC Festival of Architecture**
**Regina, Saskatchewan**
*June 10–13*
This year, the Royal Architectural Institute of Canada's annual convention will focus on connecting architects to the communities in which they live. A trade show will take place on June 12. Delta Hotel. For information call Rory Picklyk at 306/352-2660.

**We, the House Builders of Austria**
**Vienna**
*June 10–August 3*
This exhibition traces the development of the single-family home in postwar Austria, the housing choice of 80 percent of the country's population. Architecktur Zentrum Wien. 011/43-1-522-31-15.

**The Architecture of Graham, Anderson, Probst & White**
**Chicago**
*June 11–September 6*
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**Solar '98: Renewable Energy for the Americas**
**Albuquerque, New Mexico**
*June 13–18*
Policymakers, scientists, architects, and businesspeople will be leading and attending symposia and workshops, joining the efforts of the American Solar Energy Society, the AIA Committee on the Environment, and the American Society of Mechanical Engineers, concerning the integration of solar energy use into design. Albuquerque Hilton. For information call 303/443-3130 or visit www.ases.org/solar.

**Entrepreneurship, Innovation, and Design Conference**
**Wellesley, Massachusetts**
*June 15–17*
A conference by and for senior corporate executives about methods of achieving success through design. Babson College. Call the Corporate Design Foundation at 617/350-7097 for details.

**International Conference on Universal Design**
**Hempstead, New York**
*June 17–21*
The conference offers workshops on designing buildings that are universally accessible. Submissions for a student competition, "A Community Gathering Place for the 21st Century," will be on display, and the winners will be announced during the conference. Hofstra University. Contact Adaptive Environments at 617/695-1225 x0 V/TTY for an informational brochure, which is also available in Braille, large print, or on disk.

**Megaform as Urban Landscape**
**Jerusalem**
*June 21–23*
At this year's Jerusalem Seminar in Architecture, Richard Meier, Rafael Viñoly, Ricardo Legorreta, Henri Ciriani, Fumihiko Maki, Steven Holl, and other designers will present projects and discuss how the megaform could help ameliorate today's urban landscape. The seminar is moderated by Kenneth Frampton. International Convention Center. Call 011/972-2-563-904 or visit www.jersemar.org.il for more information.

**Under the Sun: An Outdoor Exhibition of Light**
**New York City**
*June 21–October 25*
An exhibition of solar-powered installations, including commercial products, experimental prototypes, and commissioned designs. Cooper-Hewitt National Design Museum. 212/849-8300.

**Construction Specifications Institute Convention**
**Baltimore**
*June 25–28*
The CSI, celebrating its 50th year, expects 9,000 construction professionals to attend this year's convention and exhibition of new commercial building products. Former HUD secretary Jack Kemp will be the keynote speaker. Baltimore Convention Center. For more information call the CSI at 800/689-2900 or visit www.csinet.org.

# Competitions

**Vital Signs Student Competition**
*Submission deadline: June 15*
The Vital Signs Project, administered through the University of California, Berkeley, announces its 1998 Student Case Study Competition. Undergraduate and graduate students in ACSA member schools of

(continued on page 210)

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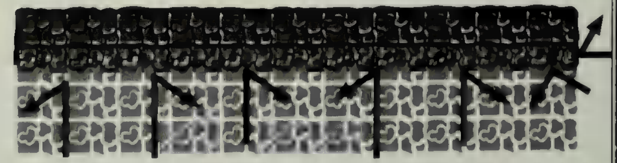

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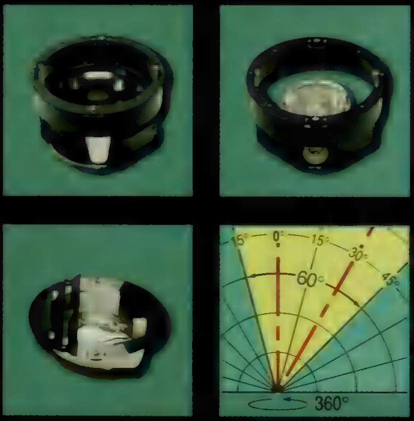

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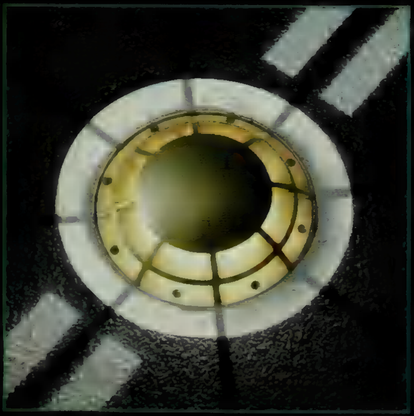

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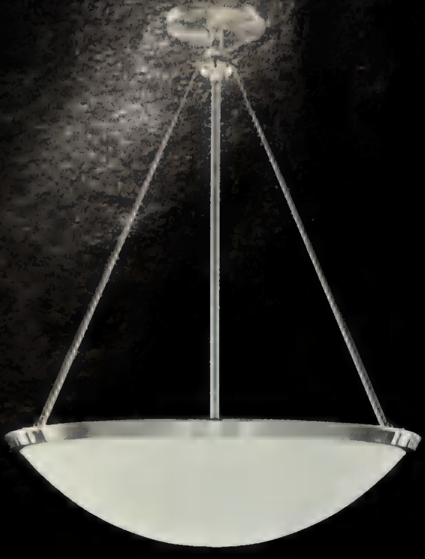
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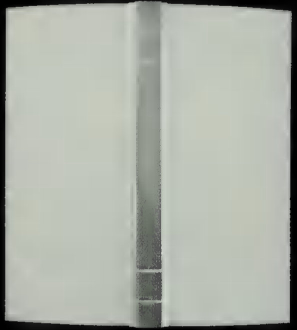
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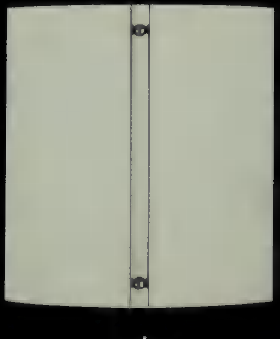
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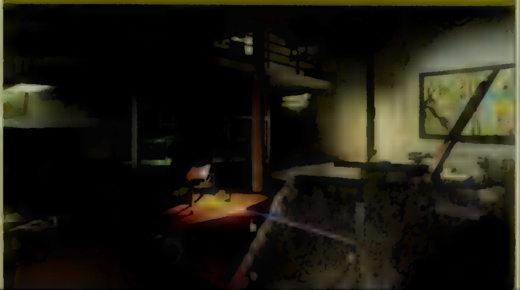

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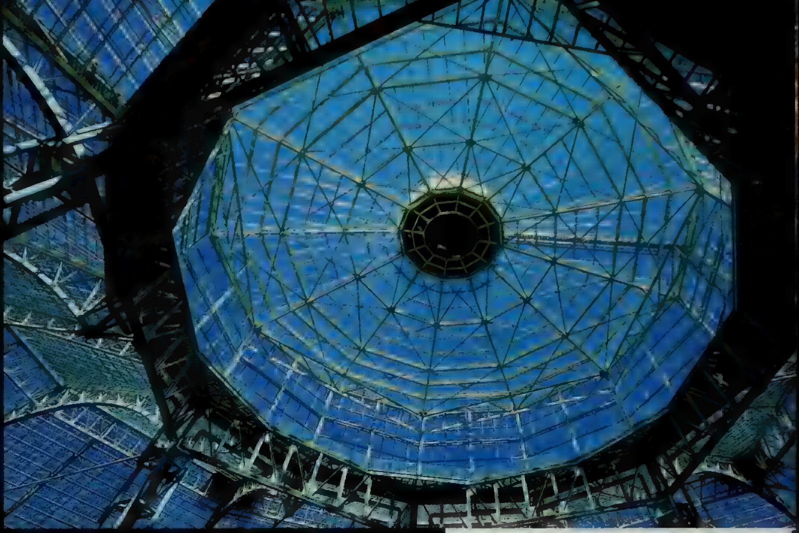

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# 18TH ANNUAL WOOD DESIGN AWARD PROGRAM

Left: Kelbaugh, Calthorpe & Associates, architect; photo: Peter Cohan, [illegible]. Right: [illegible] Architect; photo: [illegible] Kerze.

## 1998 "CALL FOR ENTRIES"

**THE WOOD DESIGN AWARD PROGRAM HAS ANNOUNCED A "CALL FOR ENTRIES" FOR THE 1998 COMPETITION. NOW IN ITS 18TH YEAR, THE PROGRAM HONORS OUTSTANDING WOOD PROJECTS IN TWO CATEGORIES: COMPLETED WOOD BUILDINGS AND ARCHITECTURAL WOODWORK INTERIORS.**

Judges are John M. Dixon, FAIA, Architectural Writer; George E. Hartman, FAIA, Hartman-Cox Architects; and Julie Eizenberg, Koning Eizenberg Architecture.

Entered projects, whether new or remodeled, must exhibit high quality design employing traditional, engineered or custom wood product applications. Winning designs will demonstrate a thorough understanding of the properties of wood and display appropriate applications in building programs. All projects must have been completed since 1995 to be eligible for entry.

Submission deadline is September 18, 1998. Entry materials can be obtained from Judy Durham at the Architectural Woodwork Institute (AWI), 1952 Isaac Newton Square West, Reston, Virginia 20190. Direct contact can be made with AWI by telephone: 703/733-0600, by Fax: 703/733-0584, or e-mail: jdurham@awinet.org. *1997 Wood Design Award Program* Brochures are available upon request from AWI.

The 1997 Wood Design Award Program, formerly known as the American Wood Council Wood Design Award Program, is now sponsored by the Wood Products Promotion Council (WPPC). Participating associations include the American Wood Council/American Forest & Paper Association, APA—The Engineered Wood Association, Architectural Woodwork Institute, Canadian Wood Council, Southern Forest Products Association, and Western Wood Products Association.

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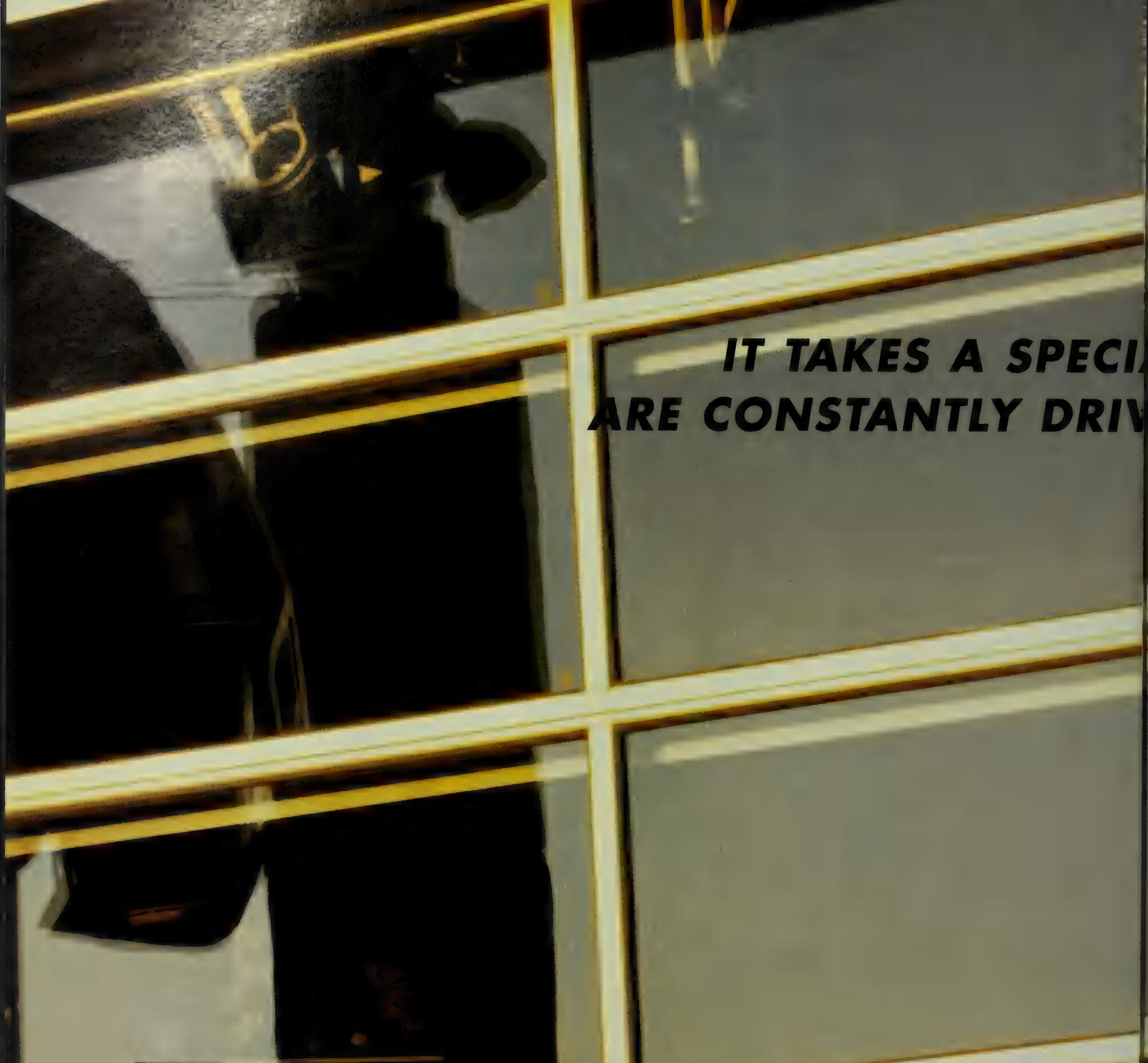

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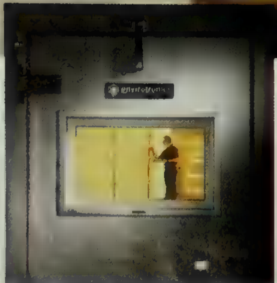

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# The Urban Vibe

EVERY CITY HAS ITS OWN VIBE, SAYS MICHAEL SORKIN, WHO ROAMS THE STREETS OF AMSTERDAM, VIENNA, BERLIN, AND HIS HOMETOWN OF NEW YORK TO FIND IT.

**by Michael Sorkin**

Strolling through Amsterdam you can catch the cannabis whiff wafting from the coffee shops. For '60s me, this has always stood for the combination of tolerance, practicality, and a kind of decadence that seems especially Dutch. Down the street, hookers perform self-commodification, advertising their wares in the bay-window showcases adjoining their boudoirs. This tableau is also very Dutch in its architectural expression. Holland is the nation of the window and the invitation to gaze in.

Cities have vibes, and Amsterdam is an especially mellow place. The feeling in the street is one of tolerance and solidarity; the boundaries of fear are set very wide. Amsterdam isn't a city that provokes anxiety when one has to ask for directions or advice from strangers, and this, I think, is a hallmark of a great urban culture. Such civility—so eloquently set out by Jane Jacobs in her descriptions of the character of good neighborhoods—is, of course, a product of culture, not architecture. But architecture is also a product of culture. How does architecture reinforce this sense of vibe?

Amsterdam marks a high point of the architecture of neighborliness. Its architecture is extremely complex, constructed from the delimited vistas of winding streets and canals, from the richness and charm of a texture built up by small increments—bricks, pavers, window panes, fittings—and from the centuries-old patina of both careful addition and the minor de-symmetries of subsidence and wear. Colluding in this conviviality are also ease of movement and the preference given to walkers, bikers, boaters, and trams; the small, local scale of commerce; the density of cafés, restaurants, bars, and those "coffee" shops; and especially the luminous, graceful, and intimate domestic architecture. Holland is still the most densely populated country on earth, and in its old cities it has produced an exemplary culture—not of congestion, but of density.

One of the striking qualities of Dutch domestic architecture is its transparency. Walking those Dutch streets, a passerby gains access to the whole spectacle of bourgeois domesticity. Through the big windows of the beautiful party-walled houses, people pursue daily life unselfconsciously. Here's a wonderful seam between culture and architecture, a set of building practices that have been worked out to serve both necessity and values. Dutch architecture summarizes Dutch culture very succinctly. And, to me, there's no question that the magic in the environment contributes to the vibe, reinforces the civility. Part of this springs from a sense of openness, a productive surrender of privacy in which surveillance goes both ways. For the Dutch, this visibility works because of a kind of cultural frankness, the idea that there's nothing to hide because all is tolerated.

I've noticed the same sort of casual civility in certain vacation spots on Fire Island or Cape Cod. There's an implicit compact of good

In the streets of Amsterdam, walkers, bikers, and trams interact and overlap with an ease of movement. The scene is typical of Dutch culture, which is known for density but not congestion.

*Michael Sorkin, a* RECORD *contributing editor, is the former architecture critic of* The Village Voice.

behavior, well beyond what one expects at home. People greet each other in passing, doors are left unlocked, merchants extend tiny amounts of credit to regular faces who in turn make a great show of repaying the two bucks they were short for yesterday's lobster and chardonnay. Bad behavior also takes a holiday. Although there's an elective uniformity about holidays, it's not just the solidarity of the leisure class and the more relaxed holiday behavior, but the quality of the specially designated, circumscribed, "other" landscape that makes it possible. A vacation always presents the opportunity to participate in another set of rules, if only those that allow you to sleep until noon and never wear shoes.

The mass-market version takes place in Disneyland—the "magic" kingdom, where self-policing behavior is produced in visitors who, enjoying the hygiene and the idea of an environment dedicated to pleasure, litter less and smilingly organize themselves into orderly queues. This is not the result of a sense of literal proprietorship but stems from an implicit compact in defense of a vibe enabled by special circumstances. The question is whether this behavior is coerced. I don't think so. People are attracted to places where the deal is clear, where the possibility is visibly established.

Vibe, then, is produced by a combination of space and behavior. But the vibe can also be bad. For the last several years, I've been teaching urban design in Vienna, a city which is part of a culture that extols correctness to the point of oppression. Almost every New Yorker who visits Austria (or Germany) comes back with the same story. The street is empty but the light at the pedestrian crosswalk is red. Of course, as a New Yorker, you cross. On the curb, though, is a knot of locals waiting patiently for the light to change, their eyes boring into your back in rebuke. The behavior is all cultural: a corner where I often jaywalk has a cop stationed round-the-clock to protect the Turkish Airlines office from bomb-throwing Kurds. I've never seen him issue a jaywalking summons. Perhaps he isn't supposed to leave his post. In New York City, jaywalking has long been considered a civil right. Mayor Giuliani's recent crackdown (motivated not by any consideration for pedestrian safety but simply for the convenience of cars) has, I'm happy to say, been roundly challenged. In Los Angeles, on the other hand, jaywalking is not advised. Drivers rule the road and cops are scary: no one wants to be Rodney King.

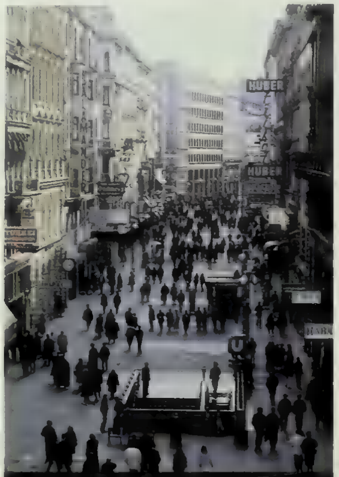
Vibe can shift suddenly and it can be very personal. Firearms unnerve me anywhere. I don't like hunters and I hate those encounters with Brink's men in the city as they escort their brethren bearing bags of dimes into the bank with their six-shooters drawn. In Vienna, although the pistols are invariably holstered, the machine guns are out. One of the more soigné bistros in town (very popular with architects) is catty-corner from an Israeli restaurant and up the street from a synagogue that managed to survive the Anschluss. Both of these places rate 24-hour police protection. Unlike their compatriots guarding the airline, though, these cops carry submachine guns. It's a sight one also sees in Germany in front of Jewish institutions. For me this evokes enormous fear. I'm made anxious by the sight of any Germanophone in uniform, especially carrying a gun. "Your papers please!"

In fact, Vienna is remarkably safe. Walking the city late at night, even down along the isolated quay sides of the canal that flows through the city center, I have no anxiety about crime, except an imported dread I bring with me from New York that periodically surfaces to suggest that in similar circumstances at home I would become fearful, which in turn makes me slightly afraid. This kind of grafted dread—the fear of fear itself—also strikes me from another angle. Walking those empty streets late at night, I realize that it was just over 50 years ago that the act of being seen in Vienna—erstwhile epitome of urban civilization—would have put

St. Michael's entrance to the Hofburg in Vienna (top) and a flak tower in the city's Esterhazy Park (bottom). In Vienna jaywalking is uncommon, except, perhaps, for visiting New Yorkers.

me in far more danger than any I might face in the most crime-ridden neighborhood in America. I become aware that the eyes at any window—those beloved peepers of Jane Jacobs—could have fingered me for extermination. Vibe, the measure of collective intent, is also a Janus.

This inflection, which cannot be repressed, extends, for me, to a deep suspicion of the elderly. When in Vienna, I often wake up in a jet-lagged daze in the middle of the night and go into the kitchen for some water. Out the window, I have a view of an old-age home across a wide garden, and I always see—in those wee hours—that many of the rooms across the way also have their lights burning. I wonder why, thinking first that in old age waking time becomes more precious. Then I wonder whether it's just guilty conscience. Unlike America, where urban fear is generally focused on youth, my Viennese criminals are geriatric. Where were they, I wonder? What was their complicity? White-haired ladies become fiends. Is this the real Vienna? Insomniac Nazi grannies eating strudel?



Kartnerstrasse, a popular shopping district in downtown Vienna, where pedestrian order prevails.

Fear is also a cultural production, and every society invents its own bogeymen. In a climate of fear, everyone becomes an object of suspicion. Walking late at night in an American city, falling in behind a woman alone, for example, whistling, heavy footfalls, and clearing of the throat are necessary to reassure her that you are not a mugger waiting to spring. Something similar sometimes occurs when competing for a cab. The basic ethics of such competitions are clear: the first arrival has priority. Complexity arises when someone appears after you, but at a distance upstream, raising a near Einsteinian conundrum of space-time. The real difficulty, though, comes if the competitor is a black man. If, for me, the sight of a cab is a godsend, for him it can be a crisis—cabbies famously pass black passengers by. Do I, I wonder, appear to cabbies to be a citizen of sufficient integrity to compel them to drive by the black man ahead of me in line? And what is that man thinking? Merely having to contemplate being victimized is an affront. And, for black people in New York, it's a definite part of the vibe.

Michel Foucault's great insight into the workings of power is his close observation of the ways we internalize the means of our own repression. The appearance of surveillance—as in his celebrated metaphor of the panopticon—causes us to behave as if we are being surveilled. Like the panoptic prisons of the early 19th century—circular jails in which an unseen central guard has the ability to look into every cell—culture looks remorselessly over our shoulders. Like docile behavior at traffic lights, the legal honor system in Vienna (and other European cities) extends to public transportation, a form of civility we'd never be able to sustain over here. When I'm in Vienna, I often take the subway to work. I always pay my fare in spite of the fact that one can simply get on the U-Bahn or a tram without either paying or passing through a turnstile. Part of my behavior may be coerced: the first week I was in Vienna, my ticket was actually "controlled" by a conductor. This early lesson was instrumental in shaping my behavior although I might easily have unlearned it by now. I haven't been controlled since.

The low frequency of these inspections would suggest that the most economical and efficient behavior is never to buy a ticket and simply to pay the fine on the rare occasions one is caught. In my own case, the reason I always buy a ticket is a combination of fear, honesty, a dedication to the idea of public transportation (something Vienna provides in efficient abundance), and a slightly more complicated desire not to give any Austrian a moral advantage over me. Why the Viennese pay (and why they wait on the curb) is another question. I see jaywalking and fare-beating as very different orders of transgression. The Viennese do not.

The way in which urban cultures impose their everyday morality is more complex than a simple reproduction of general cultural mores. The most architectural means of teaching such urban morality are styles of monumentalization and memory: cultures signal their values via their choices about what to physically revere. Amsterdam's most popular monument is the house where Anne Frank and her family hid during the Nazi occupation. There's something typically Dutch about this memorial, not simply in its evocation of resistance but also in its domesticity. An immense tragedy finds its legibility in a little house. The Frank family, packed into insane proximity, turns the physical character of this achievement upside down. And, in the end, it's a failure of neighborliness that doomed them.

In Austria, the memory of the Nazi era is deeply repressed, the subject of an almost total national amnesia. Official remembrances are few and far between. At Vienna's main memorial, those murdered by the Nazis are carefully associated with residents killed in Allied bombings. But, despite this official indifference, there are tremendous unofficial city monuments, a truly monumental unconscious. Looming over the city are half a dozen gigantic *flakturm*, or flak towers, massive concrete structures used as command posts, shelters, and gun emplacements for the wartime anti-aircraft system. Enormous but unseen, these towers are arguably the largest invisible objects on the planet.

For many years, there's been an on-again, off-again debate about what to do with them, and they make frequent appearances as studio problems in the architectural schools. One has been converted into an aquarium, and it's just been announced that another will hold a museum of coffee. In their way, they're quite beautiful. Architects see them with the same fondness Paul Virilio shows for the raw, expressionistic forms of the fortresses of the Atlantic wall reproduced in his *Bunker Archaeology*. The debate in Vienna, however, always founders at the same extreme: everyone, it seems, repeats the argument that the *flakturm* must remain because it would simply be too expensive to tear them down. Such economic logic has the gloss of practicality and is allowed to overwhelm more fundamental truths. The case of the *flakturm* is especially striking because the value of a bad memory is given an exact price.

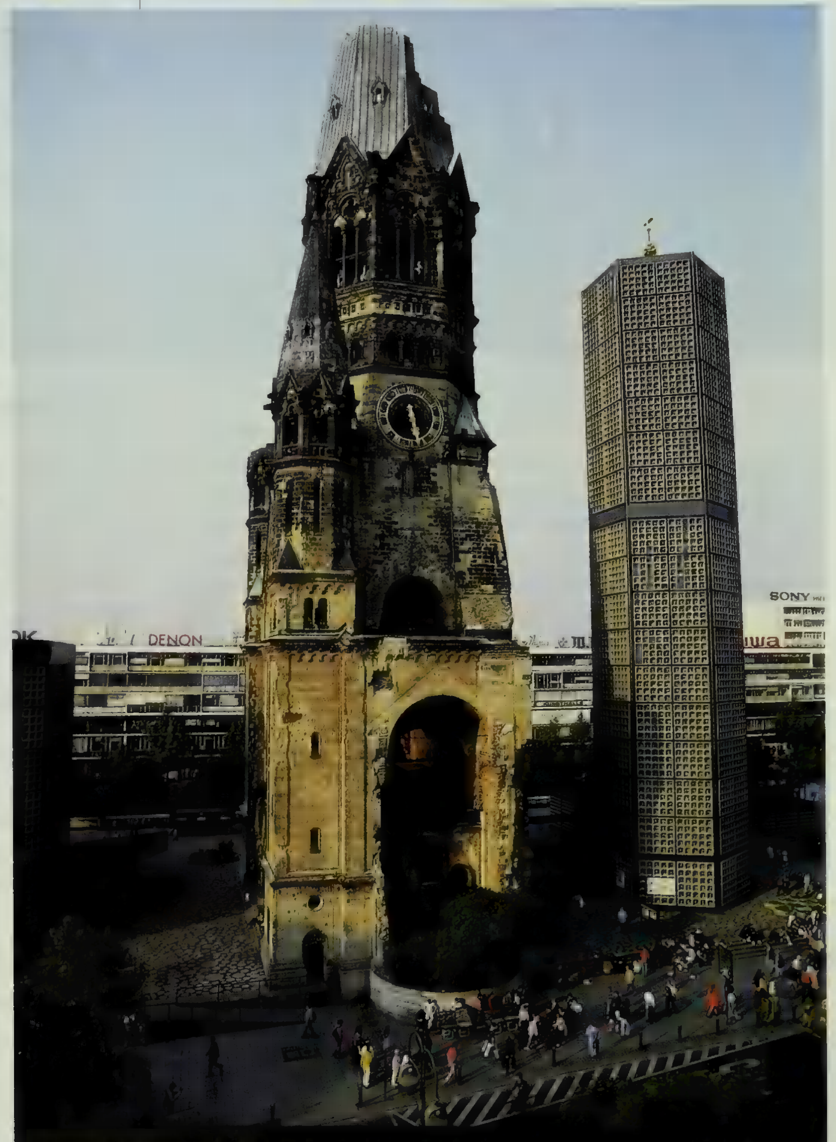
LIKE FEAR, VIBE IS A CULTURAL CONSTRUCT. THE NEUTRALITY OF THE ENVIRONMENT IS A MYTH. EVERY PLACE—KNOWABLE ONLY THROUGH OUR READING OF IT—PRODUCES A VIBE, OR WHAT USED TO BE CALLED A GENIUS LOCI.

In the beginning, I was ambivalent about the *flakturm*. To be sure, the megalomaniac, minimalist corner of my architectural taste finds them compelling and butch. But, over the years, I've come to believe that they must go, and as soon as possible. The reason is simple: people have become habituated to them. They no longer carry any force of evil, an aura they must retain if there is any logic to their monumentalization. Without this, they simply become like the pyramids, huge monuments to a vanished culture that existed way back when—tourist attractions. Stripped of evil, they can only become monuments to the Nazis.

Monuments are mnemonics of aura, bearers of the buzz of meaning in the environment. But the existence of the artifact is not enough. The more its originating context recedes, the more active and supplemental the work of interpretation. Monuments, after all, do not merely represent the past, they're containers and institutionalizers for our fantasies of the past. Modernism sought to neutralize this problem of interpretation by banishing history with the delusion that its meanings could be comfortably ensconced in "pure" abstraction. By making the global environment as uniform as possible, by celebrating an idea of subjectivity, modernity sought to harmonize vibe.

Architecture is always a form of mind control, often self-imposed. That the aggressive, destabilized forms of so-called deconstructivist architecture have, for example, flourished in Austria and Germany must certainly be connected to the desire to come to terms with a nasty sense of roots. The urgency of such in-your-face design is especially resonant in the homelands of the purveyors of orderly, criminal chaos, the builders of the *flakturm*. Although we have learned to resist pat psychoanalytic explanations for artistic behavior, it's clear that the generation of creators who spent their youth under the Nazis, as well as the local boomer generation—whose parents were Nazis—have created an art that is deeply enmeshed in the anxieties of lineage. Whether we speak of the "*blut und boden*" artists of Viennese Aktionismus, with their offal-streaked, abusive art, or their heirs in decon, the obvious sense of rage is not merely picturesque. Nor is it a one-dimensional response to the hackneyed maelstrom of contemporaneity. This is an art about guilt, and its fractious forms must be considered in the context of a culture that chooses to retain its flak towers.

A similar debate about the privileges of the past goes on in Berlin, and with far greater intensity. The most interesting current question is over what's to be done with the architectural legacy of the East. One side argues that the buildings are cheap and dilapidated and ought to go. The other contends that this architecture is a part of German history and should, therefore, be preserved. The discussion reminds me of a clarifying and hilarious project that was reported in the *New York Times* a few years ago, a proposal to create a theme park based on life in the vanishing East. Fume-belching Trabants were to cruise the potholed streets among the dreary buildings. The food was to be terrible. And, among the staff of the park were to be a number of informers who would arbitrarily arrest visitors and throw them in theme-park jail.



**A view of downtown Berlin with the Kaiser Wilhelm church and surrounding office buildings. The city struggles to decide how to incorporate the more dilapidated architectural legacy of the East, which, some argue, is an essential part of Germany's history.**

Nazi Germany was itself perhaps the most ambitious and sinister theme park ever imagined, not simply a gated community but a gated country: Germanyland. The manipulation of history was critical to this project, and I don't simply mean the racist fantasies of Nazi ideology. The Nazis had a vision of space that has been described by many as the ultimate expression of modernity's dark side, a fantasy of a hideous uniformity. Architecture was to play a key role in producing the Nazi new man. To do so, the criminal Albert Speer theorized an architecture derived from a vague sense of historic consequence. But Speer understood that history was not place but process, and his most succinct vision of the way in which history was to inhere in these buildings lay in his notion that they were to be designed for ruin (although he underestimated the time span of ruination by about a millennium). Here was an idea of history that could be entirely internal to the object, projective history, a truly terrible abstraction.

The Berlin debate describes a particularly interesting divide because neither side advances the kind of preservationist argument that dominates our own thinking: no one argues that *(continued on page 218)*

America's Best-Managed Firms:

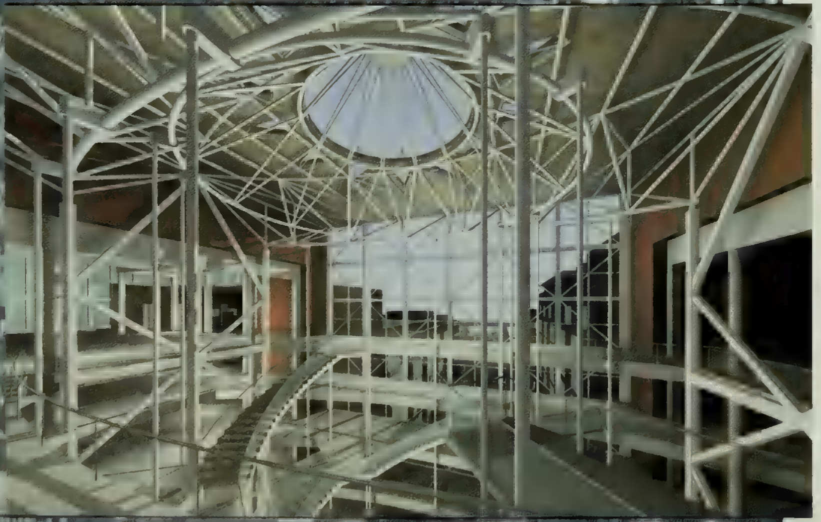
# Changing the Face of Practice with Digital Technologies

GOING BEYOND CAD, ARCHITECTS ARE USING COMPUTERS TO TIE EVERYONE TOGETHER.

**by B. J. Novitski**

When computers first arrived in offices about two decades ago, many architects predicted that computer-aided drafting systems would change the nature of practice. Better design, less paper, and lower overhead were commonly predicted. Firms have in fact benefited, but in different ways: in improved communications, coordination, and efficiency. These improvements may or may not aid in the design effort, but they have not reduced overhead or paper consumption.

The firms interviewed for this article, though different from each other in size and design philosophy, have all embraced technology early enough to have suffered on the "bleeding edge" of change. They now have important lessons to offer the rest of the architectural profession about how well-managed technology can support advances in firm management, and vice versa.



Hatfield Clinical Research Center, Bethesda, Maryland, created by Zimmer Gunsul Frasca Partnership on AutoCAD 3D Studio Max.

They know, for example, that the computer's role in architecture firms goes far beyond drafting to the broader realm of information technology (IT). Project managers benefit from systems that track how fees are being spent. Electronic mail and file exchange improve communications within the firm and with clients and consultants. Project data is saved and reused for marketing and on subsequent projects. Construction administration is increasingly automated. Eventually, well-managed firms will tie all these functions together in a unified information infrastructure. Here, a dozen firms offer advice about how to approach that goal.

### Being a leader among firms

A technologically advanced firm depends on its principals and IT directors to be vigilant about what is working and what is not—and to remain willing to shift direction when appropriate. "We try to maintain a culture of self-examination," says partner Ken Sanders of Zimmer Gunsul Frasca (ZGF), in Portland, Oregon. "Any technology decision is based on a set of assumptions, and sometimes those assumptions are wrong. You constantly have to recheck what you're doing and ask your people how the technology is working for them."

ZGF is a leader in the use of customized "extranets" (private electronic networks connected via the Internet) to facilitate communications among designers, consultants, and clients [RECORD, October 1996, page 46]. Yet Sanders discounts the suggestion that his personal vision is responsible for these innovations. The original idea

**Continuing Education** *Use the learning objectives below to focus your study while reading this month's ARCHITECTURAL RECORD/AIA Continuing Education article. Then follow the instructions on page 228.*

**Learning Objectives** *After reading the article, you should be able to:*

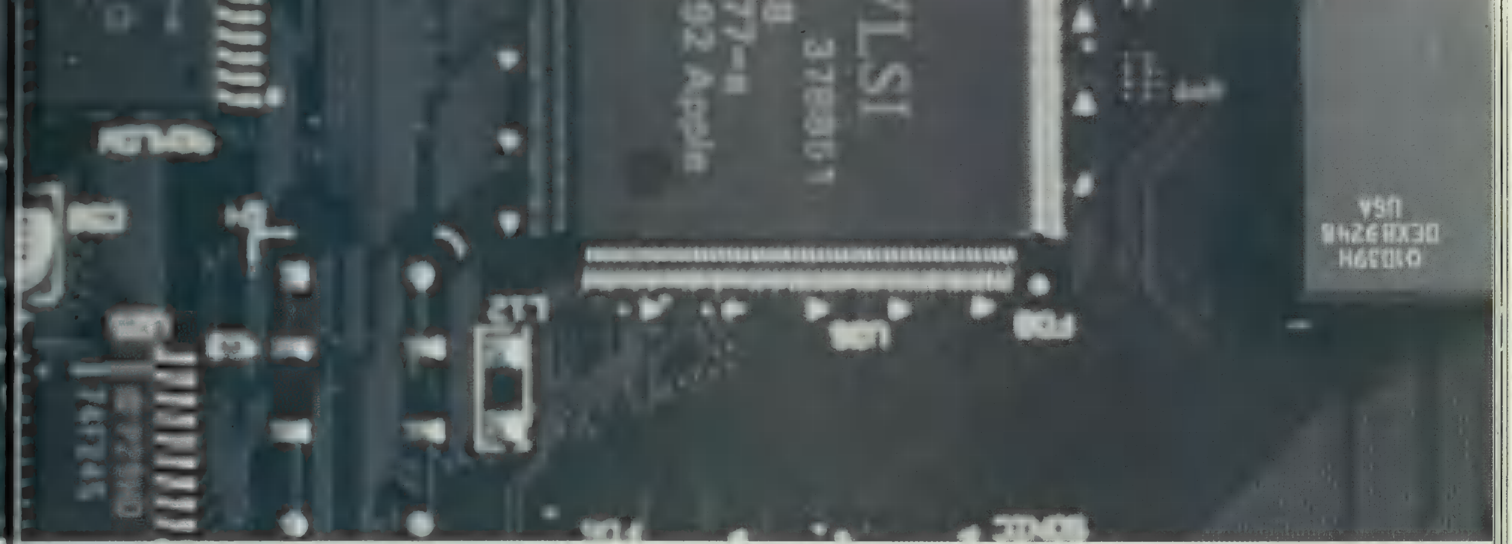
**1.** *Explain how firms have benefited from computerization.*

**2.** *Identify what principals in a firm must do to make computer technology successful.*

**3.** *Contrast issues of standardization with a creative atmosphere.*

**4.** *Identify appropriate backgrounds, roles, and promotion tracks for information technology staff.*

**5.** *Discuss the benefits of planning for information technologies.*



came from a client who had developed an on-line construction administration database. Sanders notes: "You never know who is going to have the next good idea, so you want to create an environment where those ideas can come to the surface."

You also need to seek out new ideas. Jill Rothenberg, IT director of ADD Inc in Cambridge, Massachusetts, is always investigating emerging technologies. "It's not enough," she says, "to notice that other firms have certain capabilities and decide that you might as well do that too; that's not being a leader." Instead, she makes a point of attending conferences and seminars that aren't necessarily directed at the AEC industry. After learning some new aspect of technology she can make the creative leap to implementation for the benefit of the firm.

Dan Mitchell, a principal in the St. Louis firm Mackey Mitchell Associates, emphasizes the importance of being a risk taker. His firm began to invest in computing equipment in the early 1980s, when sophisticated systems were phenomenally expensive by today's standards. He doesn't regret those decisions because being at the front of technological change now gives him a competitive advantage. Mitchell asserts, "I'd rather fail one time out of four and have a wonderful success story to tell the other three times."

### The owners' role

One of Mitchell's secrets to success is that he was both a firm principal and a technology enthusiast at the time of those early purchases. Computer savvy among firm owners is also characteristic of NBBJ in Seattle and Eastlake Studio in Chicago. More commonly, however, technology is first embraced by a staff architect who takes it upon him- or herself to bring computers into the firm, then faces an uphill battle to obtain sufficient funding from skeptical principals. That lone architect has often become the CAD manager, then the IT director, even the chief information officer (CIO), but has often lacked the credibility with the rest of staff to enforce the standards necessary for optimum efficiency.

In recent years, more firm principals have become technology proponents: some because they have been "trained" by their children or grandchildren; some because they discovered that they need computer capabilities to remain competitive; some because they recognize the genuine benefits to their staff and clients that technology can offer.

In other cases, a younger, more computer-literate generation has risen to leadership. These information technology directors may not have to struggle as hard to get the funding they need, but they sometimes complain that a little literacy can be dangerous. For example, a principal may expect *Titanic*-quality computer graphics in the firm's architectural

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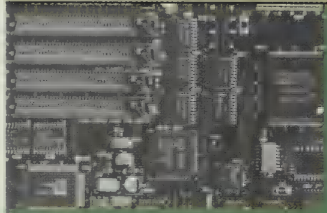
## KEY LESSONS FROM SUCCESSFUL FIRMS



Here is a list of strategies and policies that some of the firms interviewed for this article have found work for them:

- Automate your administrative functions so you can focus on design (Eastlake Studio)
- Standardize and simplify your hardware and software configurations (Zimmer Gunsul Frasca)
- Give project managers access to financial information (Mackey Mitchell Associates)
- Learn about emerging technologies (ADD Inc)
- Automate and integrate all firm data (Kohn Pedersen Fox)
- Seek a balance of computer and architecture expertise in your information technology staff (Lester B. Knight and Associates)
- Make adherence to standards the path of least resistance (Venturi Scott Brown and Associates)
- Plan carefully for technology implementations, but also encourage risk taking (NBBJ)
- Reward staff members for acquiring computer skills (Wimberly Allison Tong & Goo)
- Make information technology a part of top management (HDR Inc.)

Private residence by Mackey Mitchell Associates, modeled in Alias Upfront and rendered in Photoshop by Paul Wuennenberg

presentations or may make unrealistic scheduling promises in contract negotiations.

One thing that everyone interviewed for this article agreed on is that a genuine commitment from firm principals is essential to the success of technology integration. They must not only commit financial resources but also support the discipline needed for creating some degree of firm-wide conformity. Such standardization is especially critical for achieving coordination in multioffice firms. Angelo Privetera, CIO of HDR Inc., notes that a firm's IT director should ideally be part of management. He reports relatively little resistance to standardization by HDR employees. "We simply told people that this was the way management wants things done," Privetera says, "and that defused any argument."

Principals must be committed to IT for another reason: the cost. According to a recent survey conducted for ARCHITECTURAL RECORD by Summit Research Group of Berkeley Heights, New Jersey, architectural firms spent an average of $40,800 on computer hardware and software in 1997 and plan to spend an average of $42,700 in 1998. The biggest question and the most difficult to answer is whether this investment is paying off. Are computers reducing staff costs, increasing productivity, or expanding business enough to warrant the level of investment that firms are making in them? For most firms it's tough to say.

**Information access**

Another reason for principals' involvement in managing IT is that they can help guide the content and distribution of information. Some firms struggle with balancing a traditional desire for privacy, especially regarding financial data, with the realization that the more open the information, the more useful it can be.

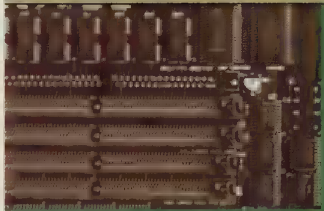
For example, it is invaluable for a project manager to have access to timely accounting of a project's labor budget. Jay Vaught, former CAD leader at Ellerbe Becket in Minneapolis and now an independent consultant for that firm, recalls the old days when project managers struggled with inch-thick, week-old printouts of accounting reports. "Now," he says, "you can get an up-to-date figure of budget spent and compare that with some measure of how far you are on a job. You instantly find out if you're behind schedule."

"Firms that withhold this information are insecure," asserts Mitchell, of Mackey Mitchell Associates. "I empower my staff when I tell them that I value their work and respect their decision making. If I were insecure about telling them how profitable we are, they would be suspicious of me. But if I enable them to manage a job profitably and reward them for it, it's a win-win situation for all of us," he explains.

Other information is also useful in firm management. As an example, Rothenberg reports that at ADD Inc, a project's complete history is maintained as a resource for the entire firm. Everything from initial leads through archives is kept in a database. The firm's in-house intranet also includes human resources information, with manuals, policies, and a "who's who" section that becomes more necessary as the firm grows. "Our intranet puts all that information in one place," Rothenberg says, "so it's easily updated and everyone has equal access to it."

A lot of the information that is now available in digital form was once the purview of the traditional mail room. Tomas Hernandez, IT director for Kohn Pedersen Fox in New York, says that E-mail, voice mail, desktop faxing, electronic transfers of drawings, and digital archiving can replace conventional paper-based communications and storage.

## HOW DO YOU MEASURE UP?



Selected items from an information technology survey of 122 architecture and engineering firms conducted by Zweig White & Associates in 1997:

- Operating system of choice: Windows 95—74 percent; Macintosh—21 percent
- Firms with a dedicated CAD manager: 30 percent
- Firms with a registered Internet domain name: 70 percent
- Firms with a World Wide Web site: 60 percent
- Median percent of employees with Internet E-mail: 90 percent
- Firms with homogeneous standards: 28 percent
- Firms giving project managers on-line access to accounting reports: 43 percent
- Firms giving employees on-line access to human resource information: 9 percent
- Firms that provide no formal training to their employees: 40 percent
- Firms without a computer network: 7 percent

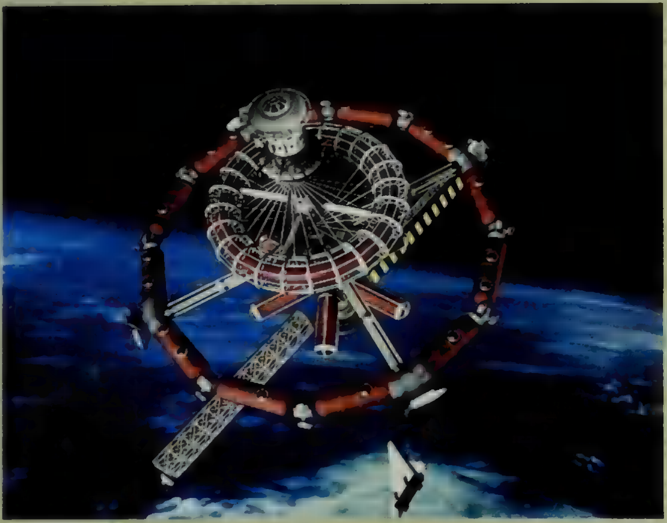
**Wimberly Allison Tong & Goo** (WAT&G), one of the 10 largest architectural firms in the United States, faces the challenge of disseminating computer skills among a multicultural staff in offices from Honolulu and Newport Beach, California, to Singapore and London. One way to do this is to make sure computer-proficient associates don't get stuck in support roles but are promoted to leadership positions.

Many firms have a tendency to pigeonhole interns with CAD expertise and deny them opportunities to advance as architects. "They're so valuable and effective as CAD technicians," says Larry Rocha, WAT&G's director of information services, "that they're not given a chance to blossom in leadership roles." To counter this trend, WAT&G has developed the CAD Coordinator Program to reward those with CAD skills. This recognition program promotes them from technician to CAD coordinator, to project coordinator, then to project manager or designer. It also assures all employees that they can develop CAD skills without risking a dead-end technical job.

The program does not succeed on its own, however. Rocha points out that it's very important for someone to champion it, to participate in hiring and firing decisions, and to be constantly vigilant about its implementation. This takes time and, therefore, management support for the associated costs and commitment to the program's success. "Without support from management," Rocha adds, "the program doesn't work; and for management to support it, they have to understand it."

A second related initiative is called the Super-User Program, which encourages employees to develop a special expertise in computer areas other than CAD. The firm wants to recognize, promote, and support people who take the initiative to solve business problems through technology. For example, someone may come up with a spreadsheet or word processing template for a standard log or form, which they are encouraged to share with the rest of the firm. These innovators are rewarded with opportunities for additional training classes and are considered more valuable to the company. This value is remembered when it comes time for bonuses and raises.

Like other firms, WAT&G grapples with finding the right balance between conformity and flexibility. Sharing drawings and other information electronically can be simpler and less expensive if all offices operate with the same hardware, software, and standards. But enforcing those standards is difficult, not only because many architects believe that conformity is incompatible with creativity, but also because international firms are characterized by cross-cultural differences. Standards are needed, but it's important for regional offices to feel they have the power to respond to local circumstances, says Rocha. *B.J.N.*



**Space Resort Orbiting the Earth, created by Wimberly Allison Tong & Goo on AutoDesk 3D Studio**

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Electronic communications can ease decision making; digital archiving can make information retrieval a snap instead of an arduous task. "All this needs to be automated and integrated," he says. "I'd rather do an electronic search on a couple of compact discs than go through 18 boxes of paperwork in search of a project's history."

Unfortunately, there are obstacles to the digital transformation. The mail-room staff may not have the background to work with computers, and the IT staff, which probably evolved from CAD management, is often organizationally separate from the office-management staff. Although it's important, the automation of paperwork may be uninteresting to the technically savvy. "Everyone has this problem," Hernandez concludes, "but if we can solve it, it will improve how we communicate among ourselves."

### Standardization: demon or angel?

For a profession that prides itself on its creativity and, occasionally, its eccentricity, technology's need for conformity can be a difficult pill to swallow. Most firms interviewed here accept that medicine and enforce hardware and software standards. ZGF, for example, uses only one CAD system and one generic PC platform. Sanders claims that this keeps things simple, facilitating file exchanges, easing printing and plotting, and reducing the cost of operational support and training. All 47 HDR offices have the same hardware, software, and CAD system configurations, enabling long-distance collaborations. Privetera says that every HDR office can borrow the expertise of any other, and geographically distant teams can work as easily and productively together as if they were in the same room.

But conformity has its disadvantages. According to Mark Evans, CIO of Knight Advanced Technology in Chicago, standardization is at odds with the democratic and creative atmosphere found in many firms. "Many studios are almost independent practices," he points out, "and each project manager has developed a following and a way of doing things. That's where a lot of the synergy is. If you want integration and uniformity, you almost need a dictator."

Clearly, finding a balance is a delicate job that each firm needs to work out according to its own culture. Once you've decided that the advantages of standardization are beyond question, how do you persuade creative people to conform? One common strategy is to make the desired behavior the path of least resistance by presenting the firm standards as software defaults.

At Venturi Scott Brown and Associates in Philadelphia, associate James Kolker has tackled the dry but crucial issue of job list management in this way. "For a medium-size firm," he notes, "we have a lot of projects, with a lot of numbers, subnumbers, services, and so on. It used to be easy for people to post their time to the wrong job numbers. Now that we

## PROFILE

**Lakeside Residence, Lakeside, Michigan, by Eastlake Studio, modeled on form*Z and rendered on Studio Pro by Mark Niemi**

**Defying conventional wisdom** that a company must grow to survive, Eastlake Studio in Chicago works hard to stay small. And computer technology is key to that effort.

The firm, now numbering 12 people, was fully automated from its inception in 1987. Principals David Johnson and Thomas Zurowski chose Macintosh computers then and still use them today. Rather than focus exclusively on CAD, Eastlake exploits technology by integrating a collection of simple tools into an information infrastructure that simplifies administration. "This allows us to focus on the design side of what we do," says Johnson.

Using FileMaker Pro, Johnson and his staff have created an intranet that captures and distributes all the project information in the firm. It includes, among other things, financial and administrative information, an in/out board, a timekeeping system, a Rolodex, an active project list, an invoice database, a list of leads for marketing, telephone messages, and to-do lists. There are no computer passwords or locked files, and all the firm's databases are fully accessible to everyone on the staff.

Construction documents are also accessible so, for example, a contractor can get a fast answer to a question even if the project architect is out of the office. The compilation of project information gives the designers flexibility to make even major changes once design gets under way.

Johnson estimates that this efficiency enables each person in the firm to do the work normally assigned to two people. Still, he insists that speed in itself is not the goal. Technology makes practice management relatively trivial, allowing him and other staff members to put more of their personal energy into design work. "It allows us to free our minds," he claims, "so we can be designers rather than deal with bureaucratic or technical details."

Universal access to information also tends to flatten the firm's hierarchy, a strategy he says can be useful for small and large firms.

Ironically, Eastlake Studio's success in taming the paper tiger has given it an unwanted reputation as a "technology" firm. It has developed database tools for the facility management departments of corporate clients, for example, but does not want to be overlooked as a potential design consultant. Consequently, the firm has spun off a separate company, Facility Wizards, to sell database products, while Eastlake Studio focuses squarely on design. *B.J.N.*

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have instituted a central database of job numbers and names, people just select from a list."

### Capturing a firm's corporate memory

Making it easy to do the right thing has streamlined the firm's bookkeeping procedures and made its archives more accessible to future researchers. "It may seem like an uninteresting management chore," says Kolker, "but it has helped us capture our corporate memory."

Other strategies for enforcing standardization are to allow architects a degree of desktop personalization and show them how standards will help them with their work. Sanders recalls that when ZGF retired its Macintoshes and standardized systems using PCs with Windows-based software, he didn't need to convince the Mac users that Windows was better. "We avoided that debate by acknowledging that their concerns were real," Sanders says. "We conceded that Windows hadn't caught up, but we showed them that standardizing could help them be more successful."

Sanders notes that the projects at ZGF are not uniform in the degree to which they embrace technology. Not all use extranets for design communications, for example. He explains: "It all depends on the client's technological preparedness and comfort level."

### Devising an effective training program

Just as firms must find their own balance on the issue of standardization, so too must they devise their own training programs. These can include reimbursing tuition costs for formal college classes, short courses offered in-house, informal peer guidance, and self-guided tutorials. Individuals have different learning styles, so a range of options is often most effective.

It might once have seemed that the need for training would diminish over time, but the end is not in sight. The good news is that young architecture graduates have a high degree of computer proficiency, and software is becoming easier to learn and use. The bad news is that technology is changing so rapidly that everyone needs an occasional refresher course or some kind of ongoing training.

Sanders has discovered that the most effective training is "just in time." He says: "If you put someone in a class for a week, and they start using what they learned a month later, they will remember only a fraction. But if they are trained the day before, or even the minute before, they'll retain more and be more productive. So our project teams train each other, and we stay away from training in formal classrooms."

### IT staff: computer programmers or architects?

Now that IT has become so complex, encompassing telephony, networking, and Internet technologies in addition to CAD and office applications, many firms are reconsidering who should run their technology departments. Should it be an architect self-taught in computers? Or should it be someone trained in computer science but unfamiliar with the architecture profession? Although the typical IT director is smart, it is rare to find one with extensive expertise in both worlds. Mark Evans of Knight Advanced Technology, who was trained as an architect, has found this dilemma particularly irksome as he and his firm struggle with the Year 2000 problem. Systems that compute years as two-digit numbers are unable to distinguish between the year 2000 and the year 1900. If this glitch isn't remedied, soon a bill that is not yet payable, for example, could be incorrectly calculated to be 100 years overdue.

This problem is most serious among institutional mainframe computers, but Evans has discovered that architects are not immune. "A client asked us to reassure them about this," he says, "and we discovered that about 15 percent of our machines are not Year 2000–compliant. We still have shop drawing logs and other applications running on a noncomplying database, so we need to upgrade them. The problem is more pervasive than anyone expected, and ideally it should be tackled by computer experts. Architects don't necessarily know all the right places to look."

On the other hand, computer programmers may not know how to customize software to fit the needs and culture of an architecture firm. Rothenberg has been supervising the development of a database to store a project's entire history. ADD Inc hired a consulting firm to program the structure, "but we were very involved in its design," she emphasizes. "We were particular about the interface design and picked a tool, FileMaker Pro, that we could work with in-house." Similarly, Privetera says his staff monitors the network that connects HDR's 47 offices but outsources the technical network management details to Sprint.

### Customized software: does it really pay?

From time to time, firms feel obliged to develop their own software. ZGF, for example, has done a lot of its own work on its project extranets because no commercial software can yet handle the complex "transactions" that characterize construction administration. But Sanders insists that he and his staff are not programmers and that their work is a short-term solution until they can buy equivalent software off the shelf. "Other firms should look carefully at the economics," Sanders advises. "Customized software has to have a short-term payback period because in most cases you'll be able to buy the tools you've developed." As a result, Sanders focuses his energy on communicating to software developers what the profession needs and encourages them to assume the development work. Sanders says ZGF's advantage lies in gaining experience with the tools before other firms do, not in owning a proprietary solution.

THE GOAL IS TO TIE ALL OF A FIRM'S FUNCTIONS INTO A UNIFIED INFORMATION INFRASTRUCTURE.

A final trait of firms that successfully manage information technology is a deliberate approach to planning. Rather than adopt hardware, software, and practices in reaction to what others are doing, these firms take the time to reflect on where they want to go and how to get there.

ADD Inc is one firm with an extensive planning process. Every year Rothenberg and a small group outline in detail everything they plan to do and assess how that positions them for the coming year. "This ensures that we are implementing tools that will be useful for everyone," she says, "and that work within the culture of our firm." She writes a detailed budget that includes purchases, upgrades, even itemized travel costs. And each year the firm focuses on specific projects: last year it set up an office database for leads tracking, project history, and employee history. It also selected and implemented new CAD software. "This year," Rothenberg says, "our focus is in integrating capabilities and technologies so we can optimize our resources."

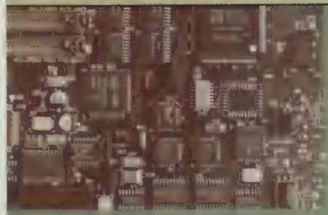
### How to change systems

One payoff of a thorough planning process is that major transitions can occur without disrupting a firm's efficiency. This is evident as NBBJ begins a six-office switch from AutoCAD to MicroStation TriForma as its main CAD platform. Former IT director Tim Stiles, who led much of the planning effort, attributes its success to the commitment of the partners, the studios, and the IT team. A core group spent a year researching the switch, experimenting in a freewheeling manner, and then reporting back what they found. "We'll have a studio doing something that seems off the wall," Stiles explains, "but it helps us understand whether going in any of these directions makes sense."

The transition of 380 seats from Windows 3.1 to Windows NT took six weeks, and the complete move from AutoCAD to MicroStation is expected to take three years. But, Stiles notes, similar moves in the past have taken only half as long as expected because the studios took the technological ball and ran with it faster than anticipated. He says: "In the NBBJ studio environment, there is no resistance to the new and different. Inquisitiveness and risk taking are encouraged." Now, in preparation for the big move, the core team is carefully developing the firm's CAD standards in the new format and fine-tuning a training program. After a set of pilot projects has been initiated in each office, every subsequent project will start with the new system. Stiles expects the transition to be both smooth and fast.

If there is one conclusion to draw from these diverse stories, it is that there is no single path to technological success. But certain key factors are essential: a strong commitment from leadership, a readiness to invest both time and money, a willingness to change, and a belief that new technologies will eventually benefit both firms and their clients. ■

## DOES INFORMATION TECHNOLOGY PAY?



In the early days of CAD, when architects first began to invest large sums of money in computers, hardware and software vendors claimed that technology would boost productivity and, therefore, profitability. Whether or not this has occurred is a matter of opinion, and often it's an opinion unsupported by hard numbers.

According to a 1997 information technology survey of architecture, engineering, planning and environmental consulting firms by Zweig White & Associates, "less than a quarter of firms have tried to measure their return on investment in information technology." Yet only 3 percent of the survey respondents believe they have overinvested.

The survey authors speculate that technology purchases are perceived by many firms as a necessary "price of entry" into the design business. Forty-four percent of the survey respondents believe that such investments actually put profitability at risk.

One firm that has tried to quantify productivity is Zimmer Gunsul Frasca, based in Portland, Oregon. The firm compared several dozen projects—half of which use CAD, half of which don't—and measured significantly fewer hours per sheet in the CAD projects, indicating a good return on investment.

However, notes Ken Sanders of ZGF, "productivity is difficult to measure precisely because you don't have identical projects done with and without CAD. And there are many factors besides computer use that determine how productive people are and how profitable a job is."

Even more important than productivity, but harder to quantify, Sanders says, is information technology's effect on improved quality of service and of design. Sanders notes that as firms respond to market forces and determine how to do more work in less time, they need to stay focused on quality, not hours, so that increased productivity isn't penalized through lower fees. B.J.N.

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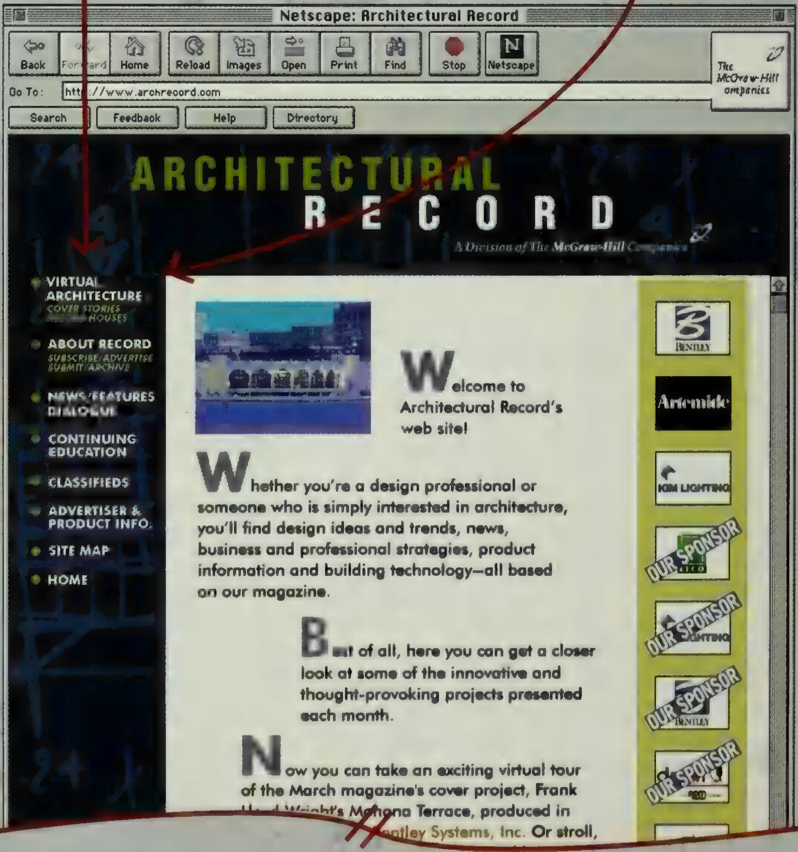

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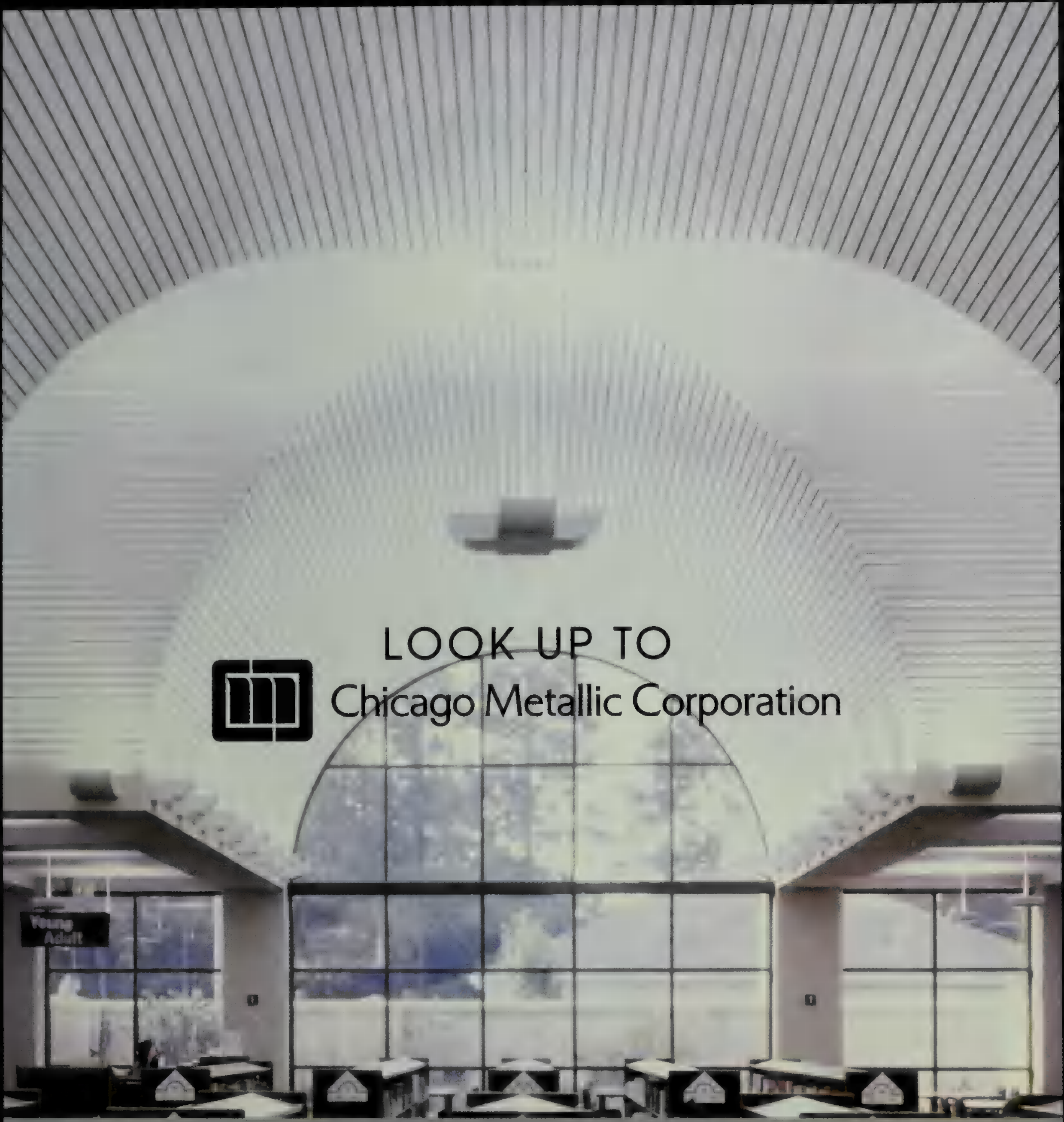

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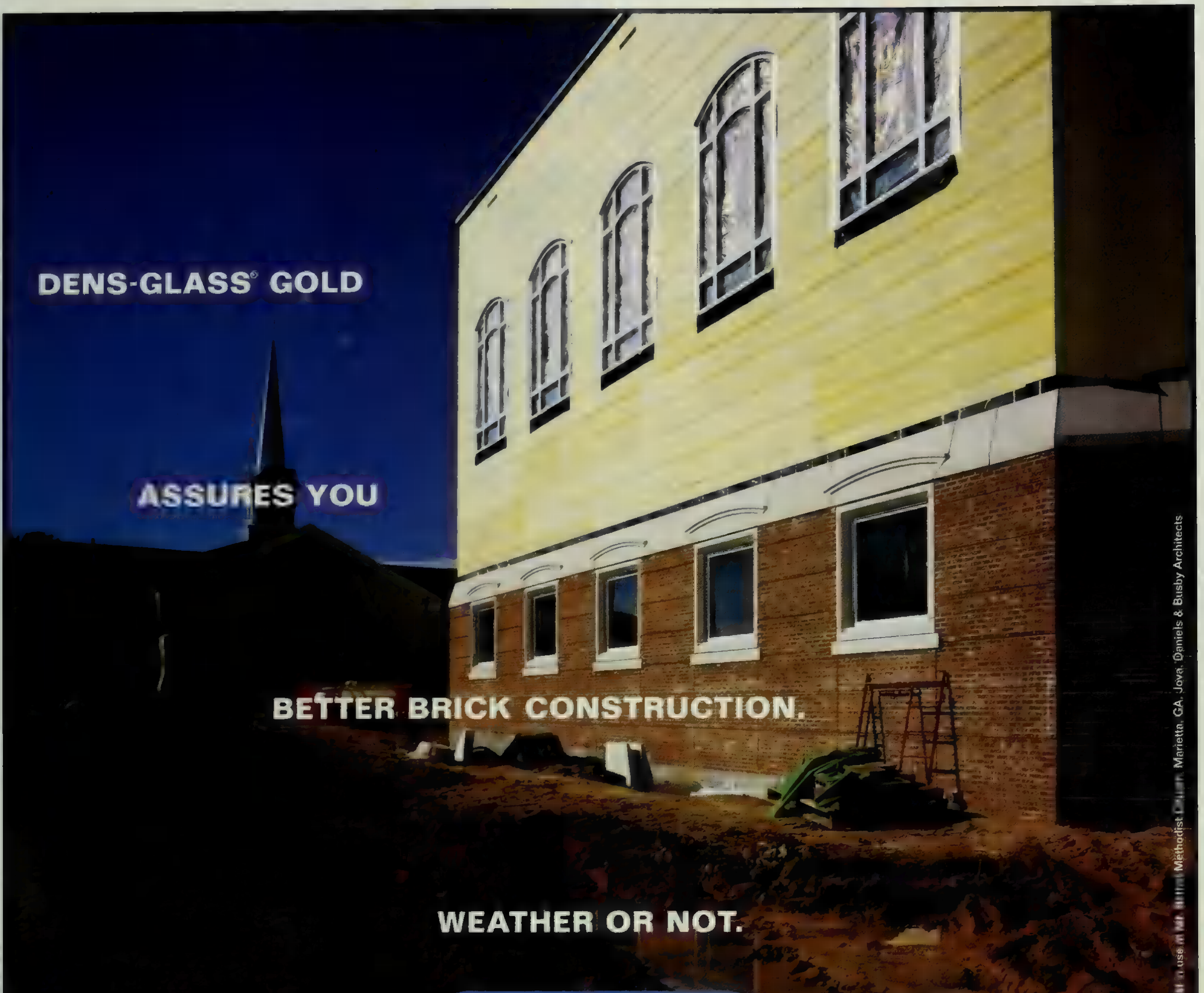

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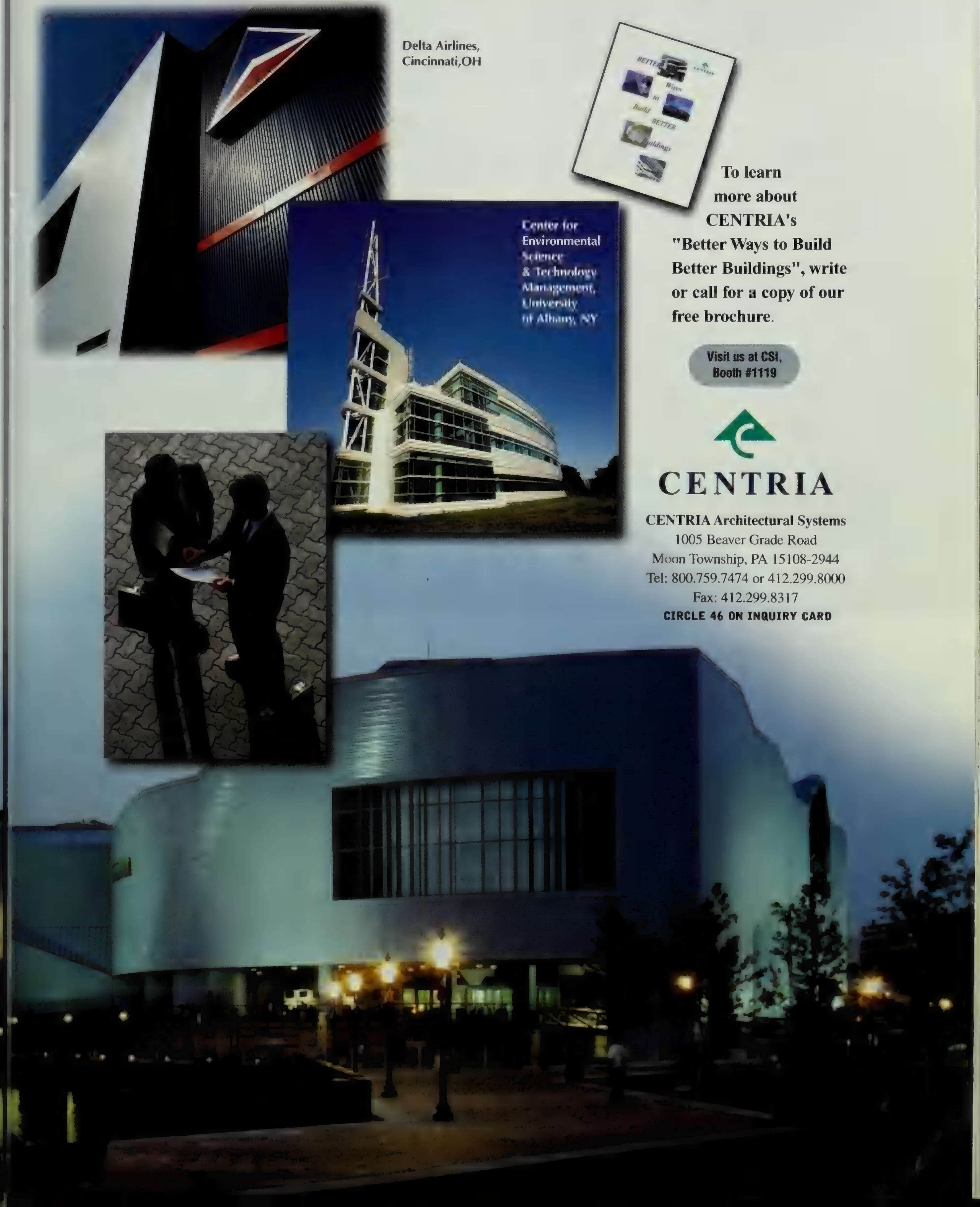

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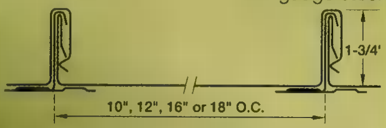

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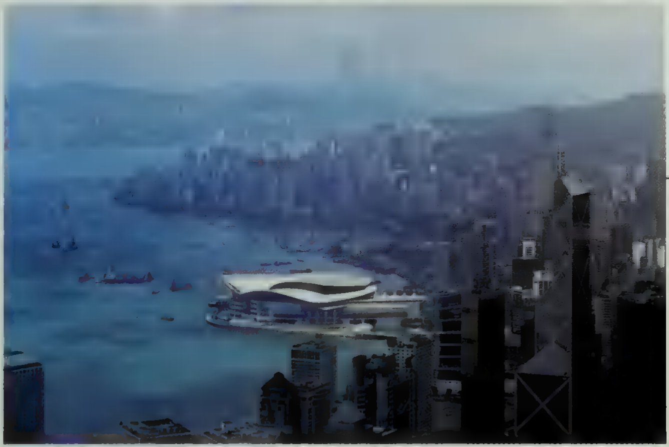
Built on landfill, the HKCEC extension juts into Victoria Harbor from Hong Kong Island (opposite). Although it can be entered from the original convention center building by way of the atrium link, the extension has its own main entrance on Expo Drive (below).

# SOM and Wong & Ouyang's extension to the **HONG KONG CONVENTION CENTER** looks toward China and, perhaps, the future.

**by Naomi R. Pollock, AIA**



On July 1, 1997, the world watched with mixed emotions as Hong Kong was returned to China, bringing to a close more than a century of British rule. While some observers feared that the event might mark the beginning of Hong Kong's demise, others saw it as a fresh start for the territory. Among the optimists were the designers of the extension to the Hong Kong Convention and Exhibition Center (HKCEC). "We aspired to make more than a landmark," explains design partner Larry Oltmanns of Skidmore, Owings & Merrill in Chicago, whose firm collaborated with the Hong Kong firm Wong & Ouyang (HK) Ltd. on the project. "We aimed for something symbolic that marked this significant point in time." Reflecting the city's sense of ascendancy and its spirit of optimism, the new building is crowned by a series of winglike roof planes whose curving forms appear poised for flight as they hover over Victoria Harbor.

## Built on landfill—like much of Hong Kong

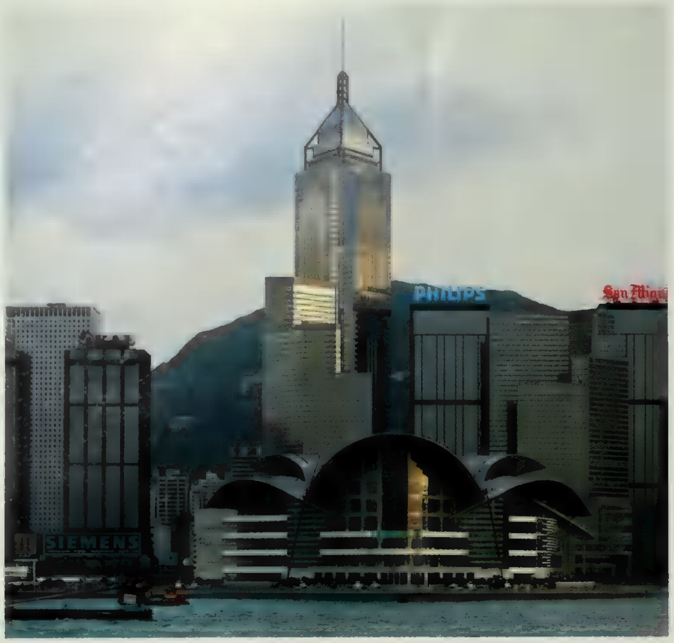
An addition to HKCEC's first phase, the 1,688,000-square-foot, six-level extension more than doubles the original center's capacity. Due to the spectacular growth of Hong Kong's convention and trade-fair industry, plans to expand the facility began to take shape just three years after its initial building was completed in 1988. The Hong Kong Trade Development Council (TDC), the semipublic organization that owns the original HKCEC, was asked by the Hong Kong Government, which fully funded and owns the $620 million extension, to oversee the design and management of the new facility. Because finding an appropriate spot to expand in the congested city center was all but impossible, an artificial island was created from 31.6 million cubic feet of sand and gravel secured by battered rock walls.

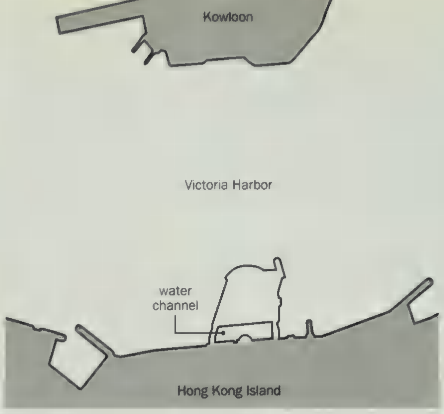
Surrounded by water on three sides, the 16-acre landfill site offered tremendous design freedom, but "we really didn't start with a blank sheet of paper," states Oltmanns. Indeed, the architects had to contend with a host of predetermined conditions. The shape of the island was determined by engineers before architectural design got started. Besides that, the architects had to work with a network of roads cutting through the middle of the site and the anticipated development of a strip of landfill stretching along the shore of Hong Kong Island all the way to Causeway Bay, east of the site. Even the placement of the 3,000 foundation pilings, which were driven in at the same time as the island was constructed (to speed up the construction process), was fixed before design development was completed.

In addition, there was the TDC's requirement that the extension and the original HKCEC be connected as seamlessly as possible. This

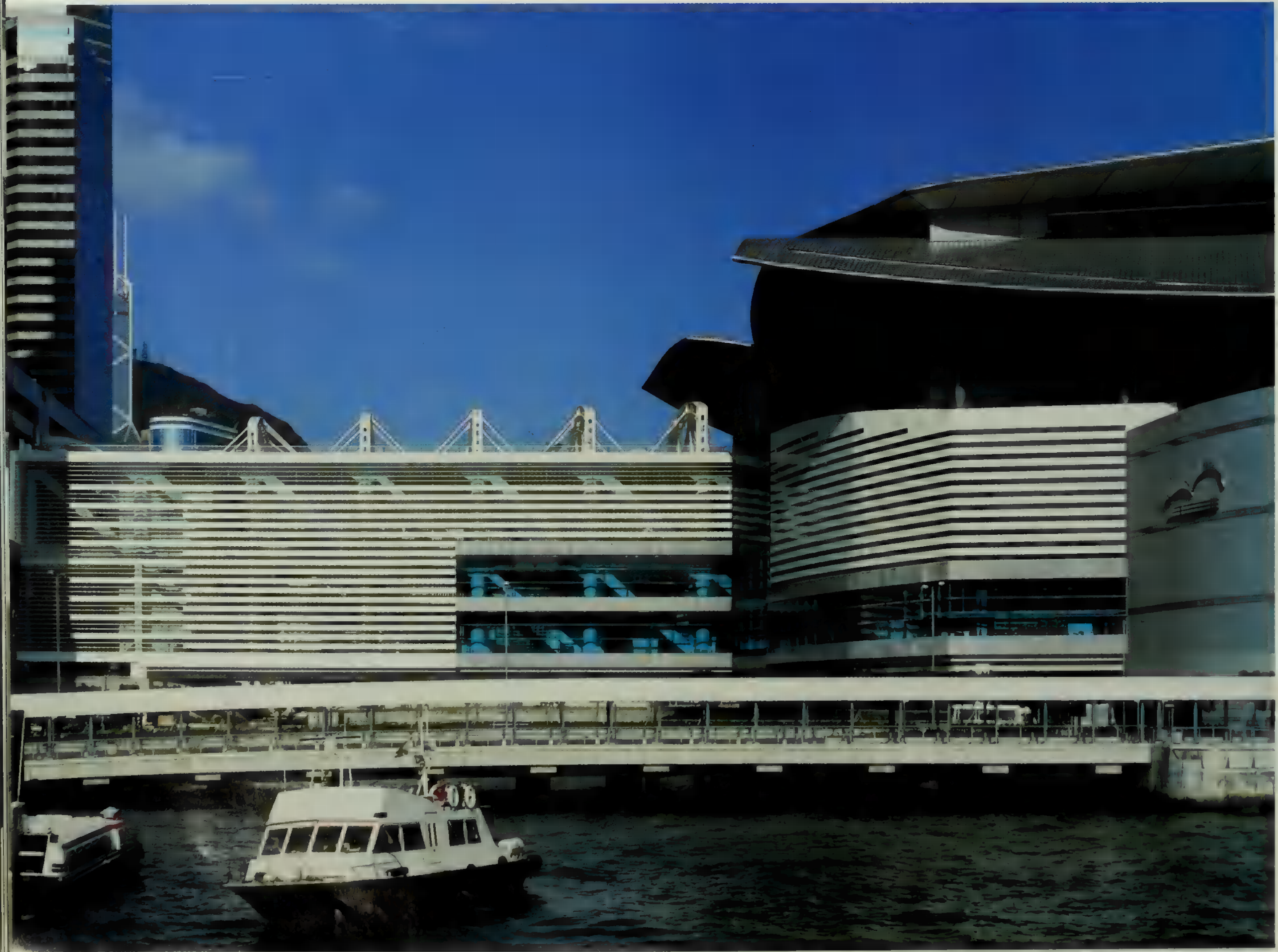
*Naomi R. Pollock, AIA, is* RECORD*'s Tokyo-based correspondent. She contributed to* Japan 2000: Architecture and Design for the Japanese Public *and curated the exhibition of the same name, now at the San Francisco International Airport.*

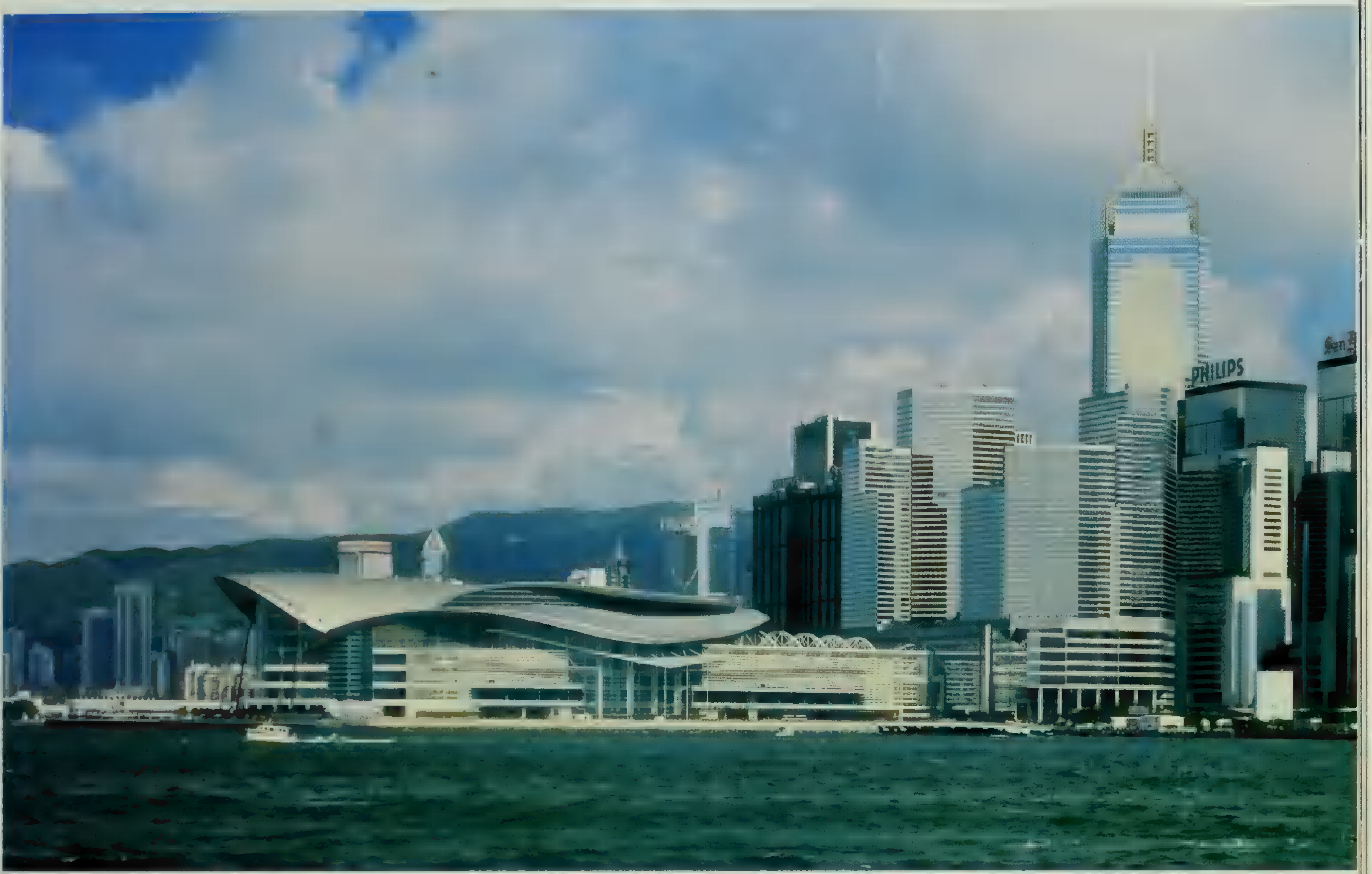
**Project:** *Hong Kong Convention and Exhibition Center Extension, Hong Kong*
**Owner:** *Hong Kong Trade Development Council*
**Architect:** *Wong & Ouyang—Wo Hei Lam, director-in-charge; Patrick S.K. Chung, project architect; Si Hung Ha, deputy project architect; Winston Sung, V. Y. Choong, Bing Tung Lam, architectural design team; Ricardo Asis, May Wong, interiors team; Danny Tang, Ken Montgomery, Mark Kelly, Jocelyn Chung, Sabrina Law, Raymond Fan, Stephen Valentine, Ralph Walker, Pak Shun Lee, George Tang, project team*
**Associated Architectural Consultant:** *Skidmore, Owings & Merrill—Larry Oltmanns, AIA, design partner; Alan Hinklin, AIA, project director; Paul DeVylder, AIA, project manager; Richard Smits, AIA, senior technical coordinator, Marshall Strabala, senior designer; Dan Bell, Joe Castner, AIA, Sophie Dahdah, AIA, Peter Freiberg, AIA, J. T. Hsu, AIA, Kamalrukh Katrak, AIA, Elizabeth Michalska, Ronald Ng, Dan Ringelstein, AIA, project team*
**Structural Engineers:** *Wong & Ouyang—Joseph K.M. Mo, Richard K.W. Kwan, Sandie Choi, Fong Ming Sum, Li Tai Wah, Peter Dorber*
**Associated Structural Engineers:** *Skidmore, Owings & Merrill—Stan Korista, Ron Johnson, Srinivasa Iyengar, Robert Halvorson, Tim Kaye, David McLean, Raul Pacheco*
**Consultants:** *Heitmann & Associates (external wall and roof cladding); SL&A Graphics (graphics and signage); PHA Lighting Design, Fisher Marantz Renfro Stone (lighting); James Carpenter (sculpture, main lobby)*
**General Contractor:** *Hip-Hing/ Dragages Travaux Publics*





**Measuring 1,000 feet from the atrium link (below) to its northern tip facing Kowloon, the extension is as long as many of the neighboring towers are tall. Aluminum banding provides much-needed sunscreening (below and opposite). The curving planes of the multipart roof help establish the building as a sculptural presence at the base of the Hong Kong skyline (left and opposite).**





challenge was made all the more complicated by the 330-foot-wide water channel that will eventually be filled in by a new expressway and subway line separating the two parcels.

The architects resolved these issues with their design for an atrium link, a glass-enclosed bridge supported by two monumental trusses cantilevered off the site of the original HKCEC. While doubling as a place for overflow registration, display, and exhibition, the link's real strength lies in the way it maximizes the entire center's flexibility. Joining the two buildings at five different levels, it enables pedestrians to move freely from one side to the other and allows component pieces on either side to be mixed and matched in multiple combinations depending on conventioneers' needs. At the same time, the atrium link permits the two pavilions to operate independently since it is accessed from, and therefore preserves, the original building's main entrance.

Many visitors, however, bypass the link and enter the extension through its Expo Drive main entrance, fronted by a 131-foot-tall glass curtain wall. This entry opens onto a lobby spacious enough to handle the crowds of people registering for the many events that take place at the convention center.

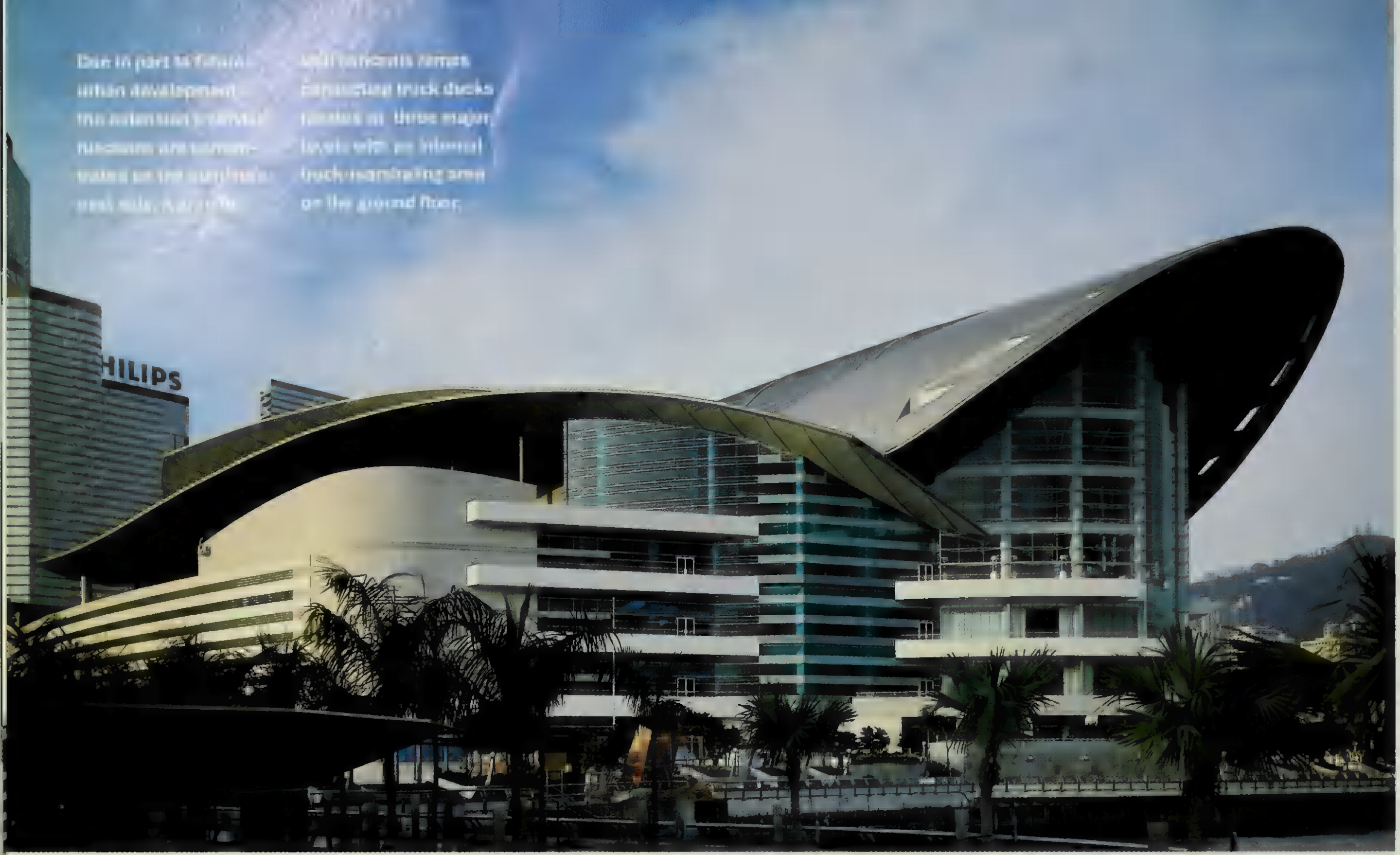
From here a sequence of cascading escalators leads the way up to the four main halls stacked on three 50-foot floor-to-floor levels. Interstitial mezzanines provide breaks in the escalator runs and house meeting rooms, lounges, and restaurants.

**A new prototype for convention centers**

Though the extension may seem very low and horizontal by Hong Kong standards, its vertical massing contrasts sharply with the sprawling, single-story convention centers found in many U.S. cities. But unlike its American counterparts, many of which are built on remote sites, this facility sits in a highly visible, attractive location that encourages its use for purposes other than just business. "This was a chance to explore a new convention center prototype that could have applicability in the United States, where many municipalities look to convention business to bring vitality back to the city," says Oltmanns.

Located at the building's core, the three black, boxy exhibition halls were configured to best accommodate the layout of booths inside. But they are surrounded by auxiliary spaces designed to take advantage of the site. While private service functions, such as loading docks at the

**THOUGH BUILT ON LANDFILL, THE FACILITY HAD TO ACCOMMODATE PREDETERMINED CONDITIONS SUCH AS A NETWORK OF ROADS AND A FUTURE SUBWAY LINE.**



Due in part to future urban development, the extension's service functions are concentrated on the building's east side. A series of [illegible] ramps connecting truck docks [illegible] at three major levels with an internal truck-marshaling area on the ground floor.

three major levels, are concentrated on the building's east side, public pedestrian areas occupy its north and west sides, where additional development is not expected. Here, ground-floor restaurants and retail stores command choice locations overlooking a waterfront promenade. And from various prefunction and circulation concourses, visitors can enjoy stunning views of Victoria Peak and the city's Central District, as well as the harbor teeming with fishing boats, oceangoing tankers, and the Star Ferry's famous green-and-white boats shuttling people between Hong Kong Island and Kowloon.

While maximal exposure to the scenery was desired, roof overhangs, fritted glass, and aluminum sunshades were used where necessary to reduce solar-heat gain. Nonetheless, the extension provides close contact with the harbor as surprisingly few Hong Kong properties do. "There is generally a sad lack of interaction between the city and the water," laments Oltmanns. "The two are often separated by expressways, and in many cases the buildings simply ignore or turn their backs on the harbor."

Another bonus of the water-bound location was the ease with which materials, the bulk of which were imported, could be brought on site by boat, reducing the need for trucks to traverse congested city streets. This arrangement helped complete the project according to its extremely fast-tracked schedule: from land reclamation through fit-up, the complex had to be finished in just three and a half years to be ready in time for the handover.

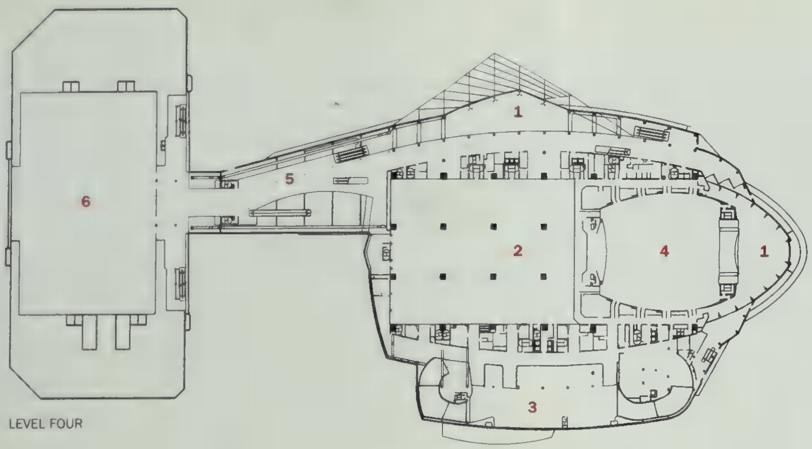
### Shaving months from the schedule

Taking advantage of the economic benefits of concrete construction in Hong Kong, where labor costs are still relatively low, the designers employed a combination of steel and concrete structural systems that also shaved valuable months from the schedule. As the concrete core walls were being poured on site, 262-foot-long roof trusses were being assembled in the Philippines using components from England and the United States. Delivered by barge, the trusses were pulled on rollers from a makeshift dock at the edge of the reclamation area and jacked up into position where they support the main roof covering the core as well as cantilevered elements beyond.

### Advantages and disadvantages of a unique roof design

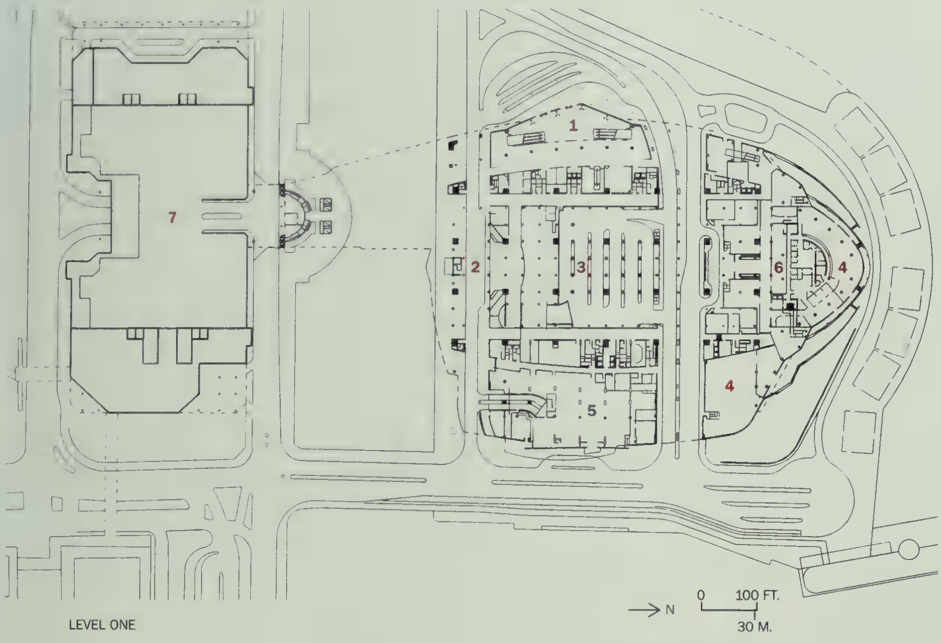
Because of the roof's variable geometry, the shape of each truss is unique; this system was easy to model on the computer screen but required more effort to fabricate than a repetitive system would have. However, the use of cantilevers reduced the weight and cost of each main support. The clear-span truss structure also enabled the top-floor exhibition hall to

**THE BUILDING'S PROMINENT LOCATION AND ITS FIVE-LEVEL STACKING SET IT APART FROM MOST CONVENTION CENTERS IN THE UNITED STATES.**



LEVEL FOUR

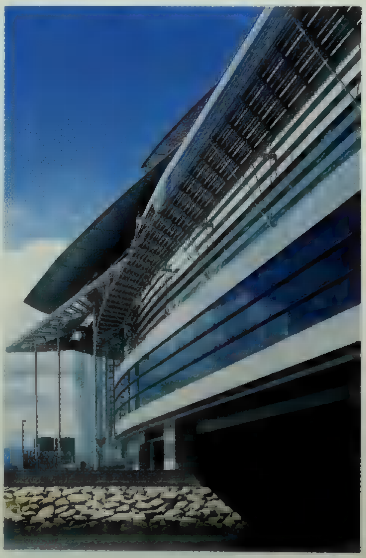
1. *Prefunction*
2. *Exhibit hall*
3. *Loading docks*
4. *Convention hall*
5. *Atrium link*
6. *Existing building, exhibit hall*

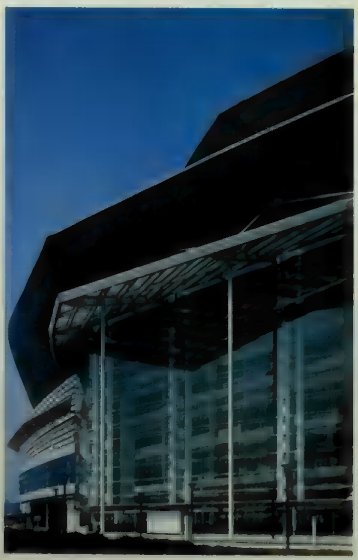


LEVEL ONE

1. *Main lobby*
2. *Bus drop-off*
3. *Truck marshaling*
4. *Restaurant*
5. *Administration*
6. *Retail*
7. *Existing building, loading docks*

**To have a significant impact on Hong Kong's visually chaotic cityscape, the extension to the convention center had to be monumental. But it also needed to respond to the human scale. The sweeping canopy marking the main entrance (right) mediates between the building's massive roof planes and the pedestrian activities below. Metal banding and window detailing also help make the transition in scale. The horizontal truss system, for example, not only supports the lobby's window wall but also throws a delicate lattice over the immense transparent panes (far right).**





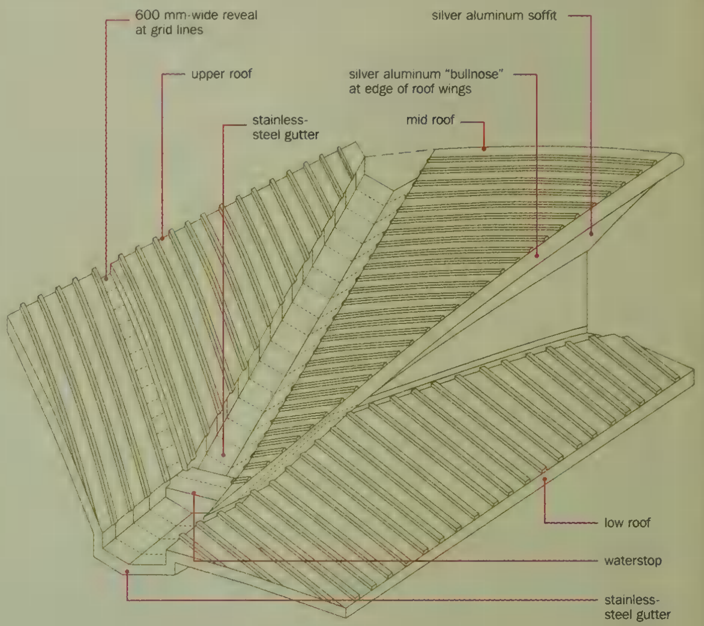
**The most striking** feature of the convention center extension is its roof, whose spectacular, curving form was designed as a metaphor for the rise of the post-handover Hong Kong. A collage of wing-shaped planes that have been cut and rotated, the roof contrasts strongly with the Central District's rectilinear skyscrapers in the background.

Oriented to the north and overlooking the harbor, the symmetrically arched upper roof crowns the center of the building, where it juts out dramatically to provide sunshade for the panoramic clear glass curving below. By balancing the entire building, the roof allows the extension to sit comfortably in its surroundings and makes it sympathetic to the Chinese desire for stability, explains architect Wo Hei Lam, a director with Wong & Ouyang.

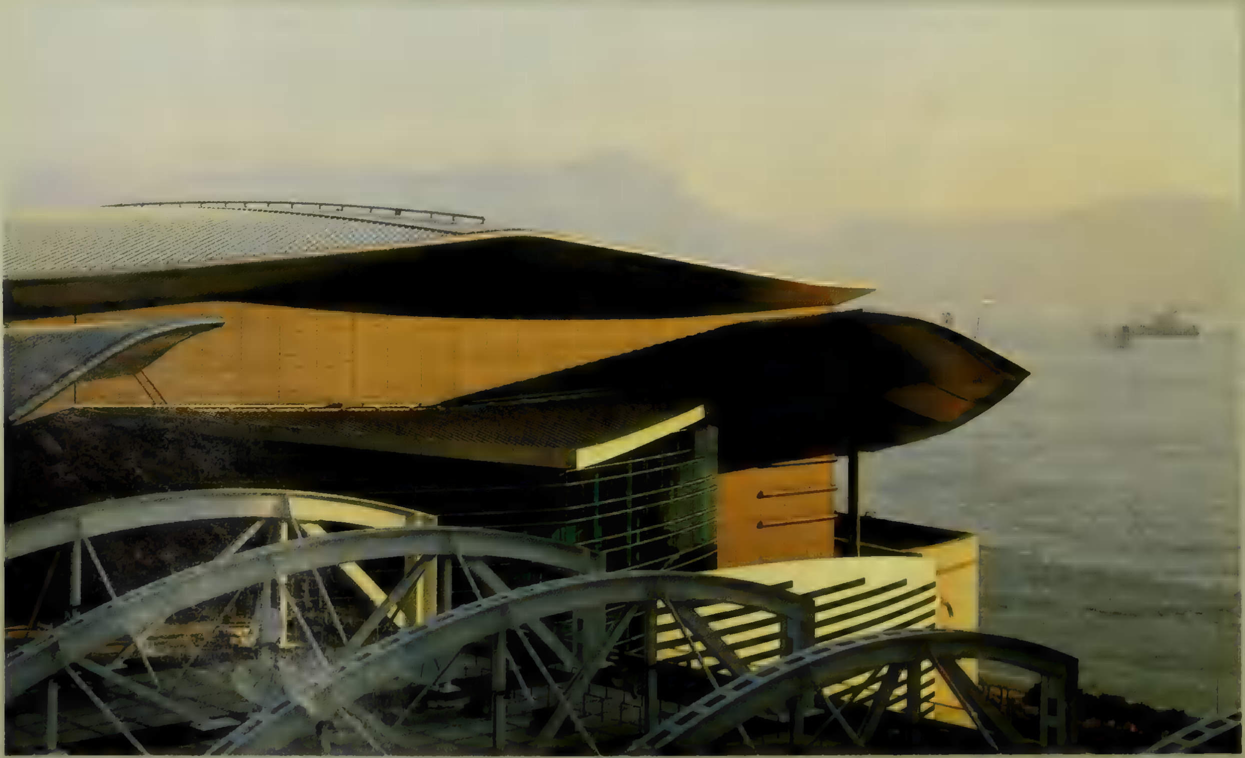
The upper roof is flanked by cantilevered, swooping planes that step down gradually, both in height and scale, and culminate in the canopies sheltering the main pedestrian entrance on the west and a secondary entrance for administrative offices on the east. Each undulating piece is made of straight, parallel-sided, structural metal decking that was assembled without having to be curved or warped. Thirteen main trusses that span the 266 feet between the core's reinforced concrete walls support the upper roof. The profiles of the trusses, spaced 44 feet apart, vary in accordance with the profile of the curving roof. Secondary trusses between the main trusses support the roof cladding. At the northernmost point of the building, where the floor plan extends beyond the core walls, the secondary trusses are supported on columns.

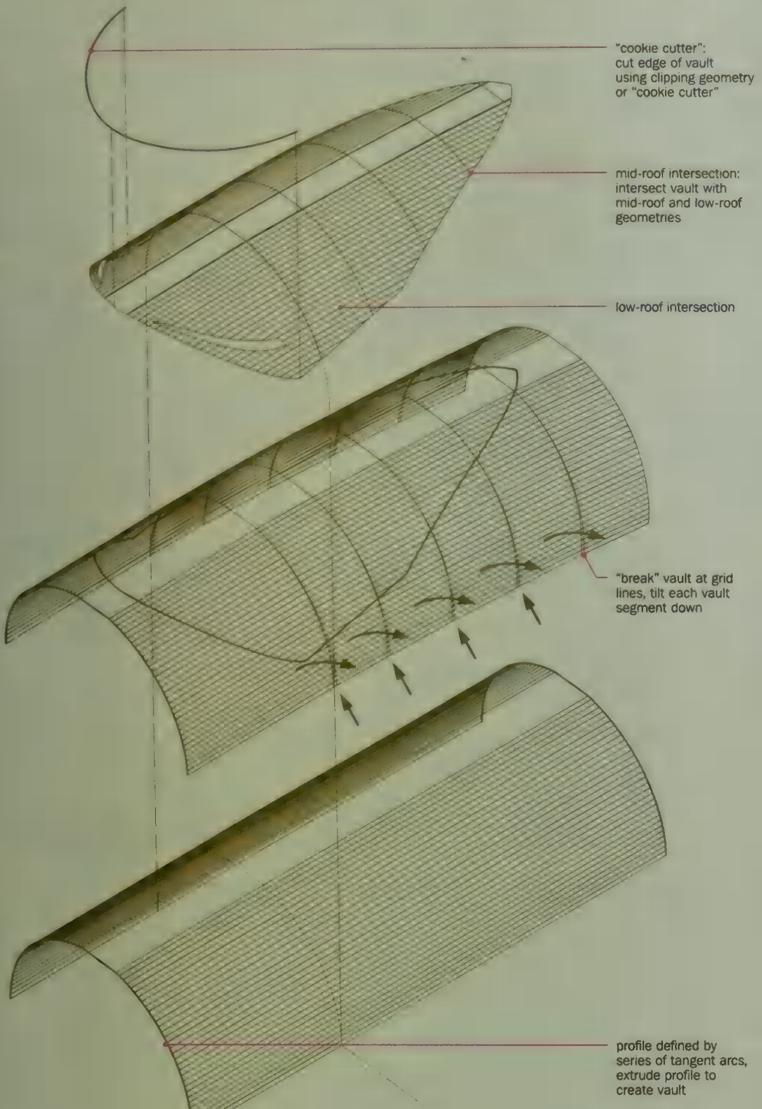
To combat typhoon-magnitude wind loads, batten-seam construction was used to lock in the roof-panel edges. The batten-seam system also accommodates the metal roof's thermal movement. Gutters at edges and joints, as well as in the roof surfaces, channel storm water to risers.

At the extension's southern end, curved planes overlap with the roof to cover the atrium link. Here, in contrast to the extension, the roof and each floor plane are suspended from exposed arched trusses. *N.R.P.*

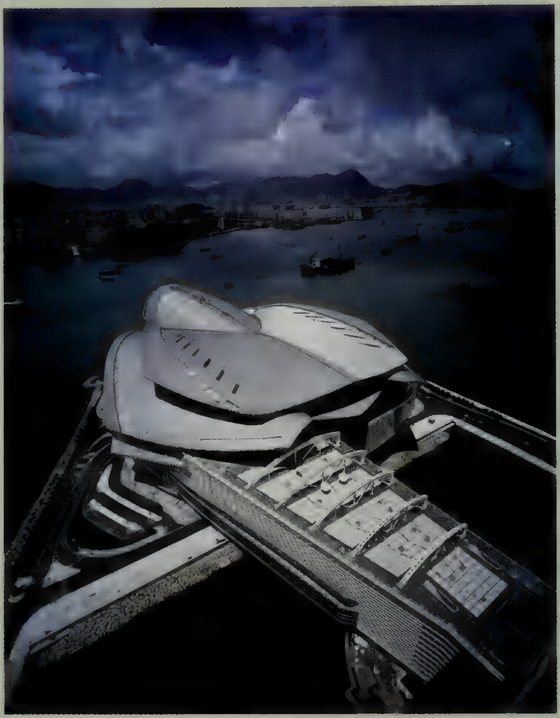


ROOF DETAIL: INTERSECTION OF UPPER, MID, AND LOW ROOFS

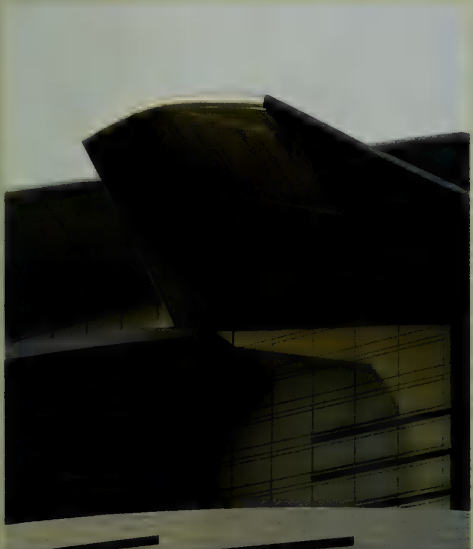


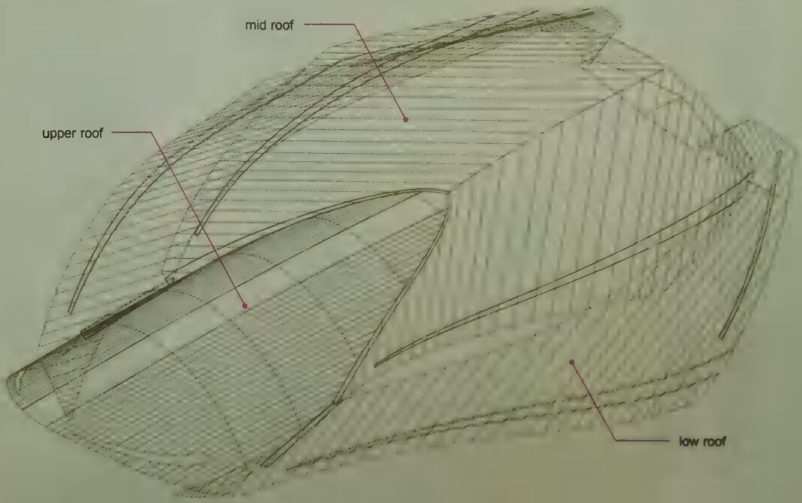

"cookie cutter": cut edge of vault using clipping geometry or "cookie cutter"
mid-roof intersection: intersect vault with mid-roof and low-roof geometries
low-roof intersection
"break" vault at grid lines, tilt each vault segment down
profile defined by series of tangent arcs, extrude profile to create vault

UPPER ROOF SURFACE GENERATION



**Though the roof appears complex, it is basically a series of arched planes that have been cut and rotated (diagrams left). Designed to express the idea of flight, the extension's metal roof dictated the profiles of its structural supports. By contrast, the atrium link's roof is dominated by the trusses from which its roof and floors are suspended.**





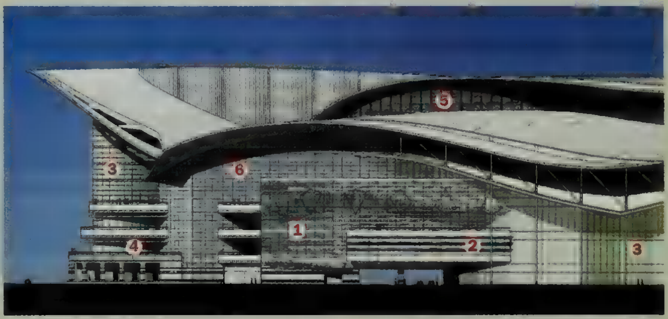
3D COMPUTER MODEL OF ROOF

**Responding to a variety of conditions,** the extension's skin consists of a number of curtain-wall types, ranging from clear glass in some places to varying degrees of opacity in others. The basic strategy was to maximize transparency in the large gathering spaces where people can appreciate the harbor views and reduce it in places such as the atrium link where people are moving either vertically or horizontally.

Reducing solar-heat gain, another key factor in the designers' calculations, pushed them to increase opacity on the east and south elevations. A final goal was to create a highly articulated wall system to help break down the extension's monumental scale—no small feat in a 1,000-foot-long building.

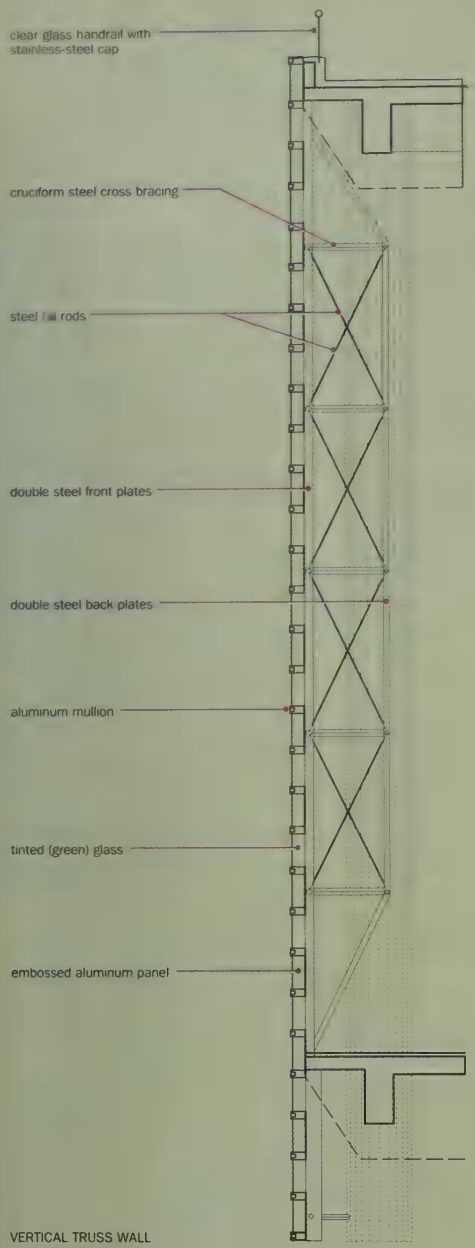
Where maximum visibility was desired, such as in the 131-foot-high grand foyer and the multilevel main entrance, bands of clear glass supported by a lightweight pipe frame open the interior spaces to expansive views. Horizontal steel trusses (see drawings, opposite), spaced to correspond to the height of the glass bands, span 45 feet between building columns and resist lateral wind loads. The trusses are suspended from the roof by steel rods, and vertical movement is taken up by slip mullions at the top of the first grade-level glazing panel. The cross members of the trusses are cruciform to make them appear as light as possible. All trusses are pinned at one end and have a slip connection at the other. Both connection points allow complete vertical movement, since the wall must be able to expand and contract with solar-heat fluctuations and accommodate roof-structure deflections in high winds.

Where solar-heat gain is a greater concern, a vertical truss wall with a more screenlike character is used (drawings, opposite). Here, bands of insulated aluminum panels alternate with 25-inch-high horizontal bands of green-tinted glass. The butt-jointed glazing is held in place by horizontal mullions supported and braced at the ends of each segment by vertical trusses suspended from the roof structure. The front and rear chords of the vertical trusses are steel plates separated to provide room for cross bracing. Thin steel rods serve as cross bracing and as horizontal ties between trusses. The same system is applied in walls that use a combination of clear, fritted glazing and special blue-tinted glazing. The details remain the same, although the spacing between the horizontal bands varies. *N.R.P.*

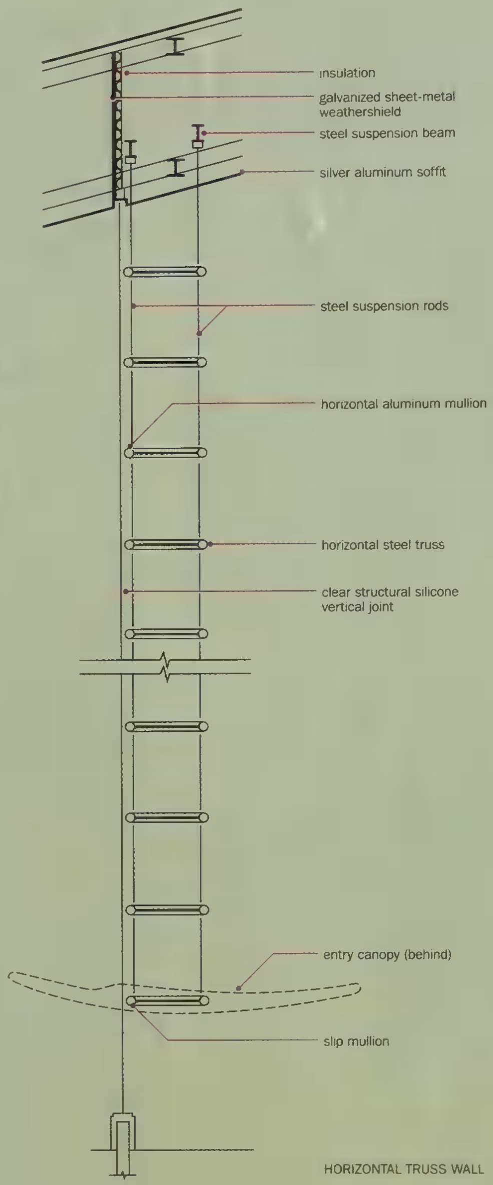


1. *Vertical truss wall with tinted glass and aluminum panels*
2. *Glass, granite, and aluminum fins*
3. *Horizontal truss wall with clear glass*
4. *Glass fin wall*
5. *Louver wall*
6. *Vertical truss wall with clear, fritted glass and tinted glass*

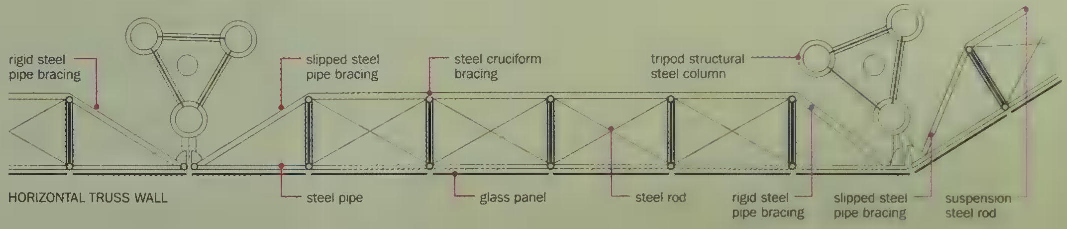
**Horizontal truss walls (section and plan this page, photo opposite left), used where maximum visibility was desired, consist of clear glass bands supported by plate-and-rod trusses spanning between columns. Bands of green-tinted glass and insulated aluminum panels make up the vertical truss walls (section and plan this page, photo opposite right), used to limit solar-heat gain.**


clear glass handrail with stainless-steel cap
cruciform steel cross bracing
steel tie rods
double steel front plates
double steel back plates
aluminum mullion
tinted (green) glass
embossed aluminum panel

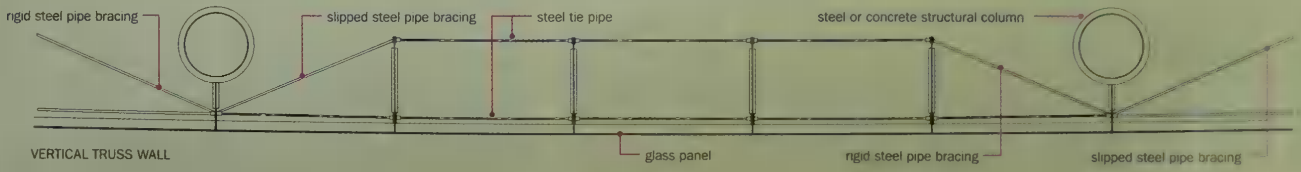
VERTICAL TRUSS WALL



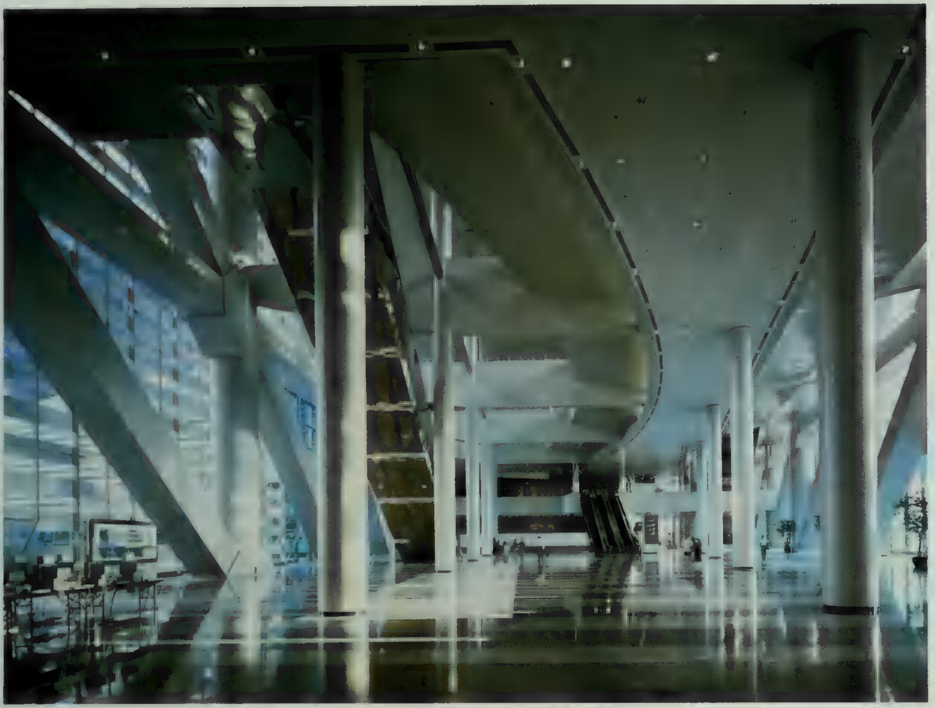
HORIZONTAL TRUSS WALL



HORIZONTAL TRUSS WALL


rigid steel pipe bracing
slipped steel pipe bracing
steel tie pipe
steel or concrete structural column
glass panel
rigid steel pipe bracing
slipped steel pipe bracing

VERTICAL TRUSS WALL



**Moving from the outside in, building materials gradually evolve from granite, aluminum, and glass at the main entrance (opposite) and the atrium link (above) to carpet and wood at the heart of the building, as in the Grand Hall (right), where the handover of Hong Kong to China took place. The architects' aim was to balance warm colors at the building's center with cool ones around the exterior, a design approach often used in Chinese architecture.**

remain column-free. Capped by an arched ceiling shaped by the curved roof, the open space can accommodate assemblies, such as tennis tournaments and basketball games, as well as standard trade-show fare. The other exhibition halls are divided by columns into 90-foot-square bays, as is the norm in single-story convention centers throughout the United States. But because the halls here are stacked on top of each other, a two-way grid of trusses serves to buttress each floor and redistribute loads without adding visually obtrusive columns.

In the Grand Hall, the scene of the handover ceremony, now used for conventions, the undulating roof doubles as the dramatic, 45-foot-high ceiling for the extension's most spectacular space. The 262-foot-wide, column-free space has specialized equipment for simultaneous translation and audiovisual presentations, in addition to ceiling-suspended rigging strong enough to support an automobile from above.

"We were worried about being able to book this space because it is so big and so grand," says Cliff Wallace, managing director of the HKCEC. But since it can handle everything from formal banquets for 3,000 to conferences for 4,200, the hall is very much in demand. And when the need arises, the Grand Hall can be expanded further by opening its four 33-foot-high pivoting doors to the curving prefunction area. This area commands a panoramic view of the harbor and looks north toward Kowloon and China.

Not wanting to offend the convention center's neighbors, the architects respected the Chinese aversion to overly angular or aggressive shapes when they were molding the building's dramatic form. "There was a great deal of discussion about the shape of the north end of the building, which points to China," explains Oltmanns. Several times during the design process, *feng shui* experts were consulted to make sure the scheme conformed to cultural norms.

"*Feng shui* isn't meant to be something superstitious," explains Wo Hei Lam, the director in charge of the project for Wong & Ouyang. "It is simply in the Chinese mind what is comfortable and stable from a cultural point of view." In its effort to accommodate rather than challenge China, the extension to the convention center is emblematic of Hong Kong's new era. ■

**Sources**

**Metal-glass-stone curtain wall:** *Builder's Federal, United Reliance*

**Aluminum batten seam roofing:** *Builder's Federal, Weatherwise*

**Glazing:** *PPG Industries (Azurlite, Solex, clear glass, fritted glass)*

**Roof soffits:** *Epic Metal Co. (Epicore acoustic roof deck ceiling system)*

**Granite and marble walls and floors:** *Tsien Wui Marble Factory*

**Elevators:** *Kone*

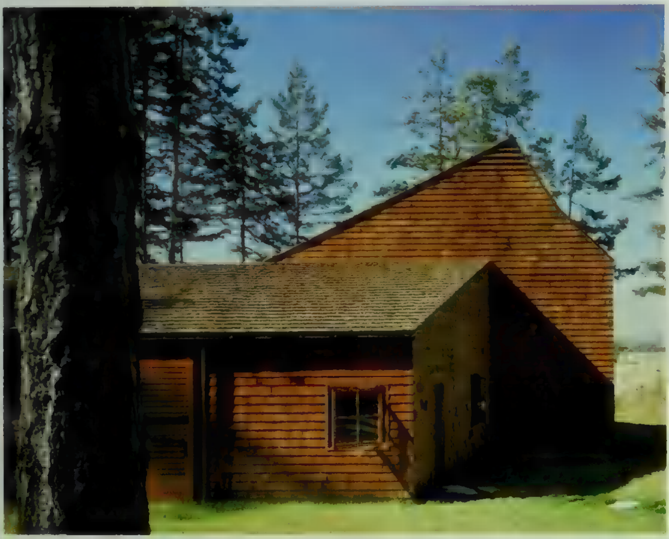
**Escalators:** *Otis*

**GRC column covers and slab-edge fascia:** *Delta Pyramax*

**Carpet tile:** *Milliken*

# Thompson and Rose's **EQUIPMENT BUILDING** in rural Washington State demonstrates that there can be elegance in utility.

**by Karen D. Stein**



**The roof of the shop, along the road (site plan below), peaks over the garage wing (left and opposite top) with its drive-through bay (opposite bottom).**

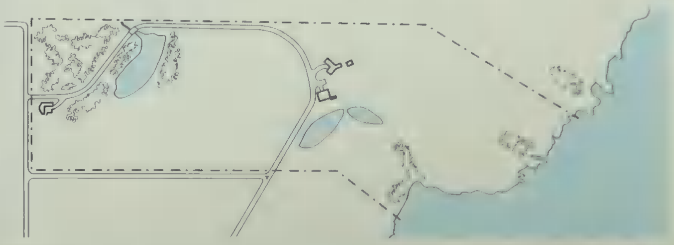
Small projects that evolve slowly are not the favorites of most architects, particularly those who are eager to establish a name. But projects for repeat clients often are. So what are the chances that a series of seemingly disconnected small commissions for the same client will lead to something memorable, if not iconic? Good, according to architects Maryann Thompson and Charles Rose. When they were just starting their Cambridge, Massachusetts–based practice in the early 1990s, like many young architects the duo did what Rose calls "a lot of kitchen jobs" to build their portfolio [see RECORD, June 1997, page 98]. One such remodeling project was for a Boston-area couple, who later hired them to do work for the family on Martha's Vineyard. The architects found their ongoing association ideal because these clients "are interested in ideas and construction," explains Thompson, even if they don't move quickly in architectural matters. "They are focused on incremental change," says Rose. "He, in particular, likes to tinker and tinker and tinker to get things right." Their client concurs. "Frankly, we love architecture and we love the process," he says.

After the couple purchased Straitsview Farm, 125 acres of rolling farmland nestled in San Juan Island, Washington, in 1988, they hired the landscape architect Michael Van Valkenburgh to transform what he recalls as "a residence with passive agriculture" into a working organic farm. Van Valkenburgh's scheme called for the creation of three ponds to collect and store enough water to irrigate 10 acres of farmland. The remainder of the property is intended for cattle grazing and berry picking by other islanders. "The idea is to gradually bring the farm back to life," says its owner.

By the early '90s, the reinvigoration of the property included a plan by Thompson and Rose, who had become the unofficial family architect, to rescue an existing farmhouse near the barn. "We were going to nuke it," jokes the owner of the undistinguished bungalow. Instead, the architects reoriented its main rooms around bay views, adding new windows and ample porches to make it a suitable vacation home. When an equipment-storage shed on the property blew away in a violent storm, the farmers who work the land asked the owners for a new one. The owners decided to "raise the aesthetic bar," they say, by asking Thompson and Rose for "an objet d'art."

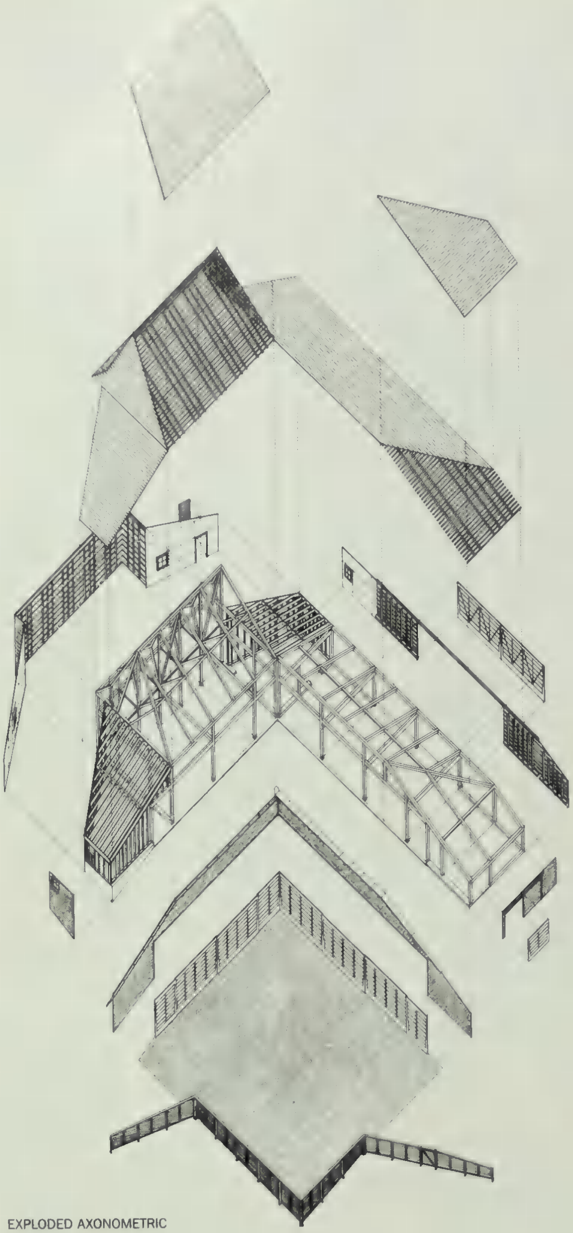
The architects worked with Van Valkenburgh to determine an appropriate site for the new 3,700-square-foot shed-cum-barn, locating it along the road and the edge of a meadow, tucked among a sprinkling of giant cedars that thicken into a grove. The building is at its highest along the street, giving it an amplified public presence, and it steps down toward the farm, as if to merge with the landscape.

Placing the structure within the line of trees "enhances the mysterious quality," says Thompson. In fact, the trees give the impression of a veil around the building, with the sunlight dappling over *(text continues)*



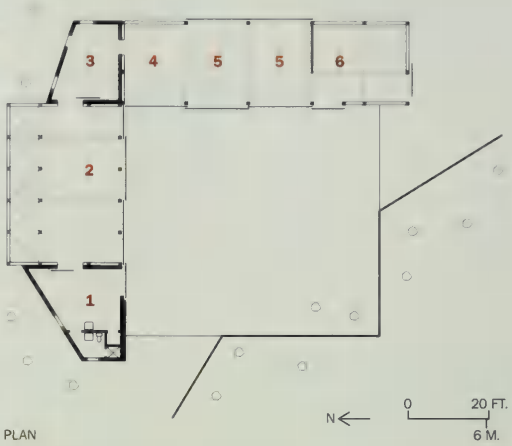
SITE PLAN

**Project:** *Equipment Building, Straitsview Farm, San Juan Island, Washington*
**Designer:** *Thompson and Rose Designers—Charles Rose, David Martin, Maryann Thompson, team*
**Landscape Designer:** *Michael Van Valkenburgh Associates*
**Consultants:** *B&B Engineered Timber—Ben Brungraber (structural); Giovanni Giustina (craftsman)*
**Contractor:** *S.B. Inc.—Steve Bobb*



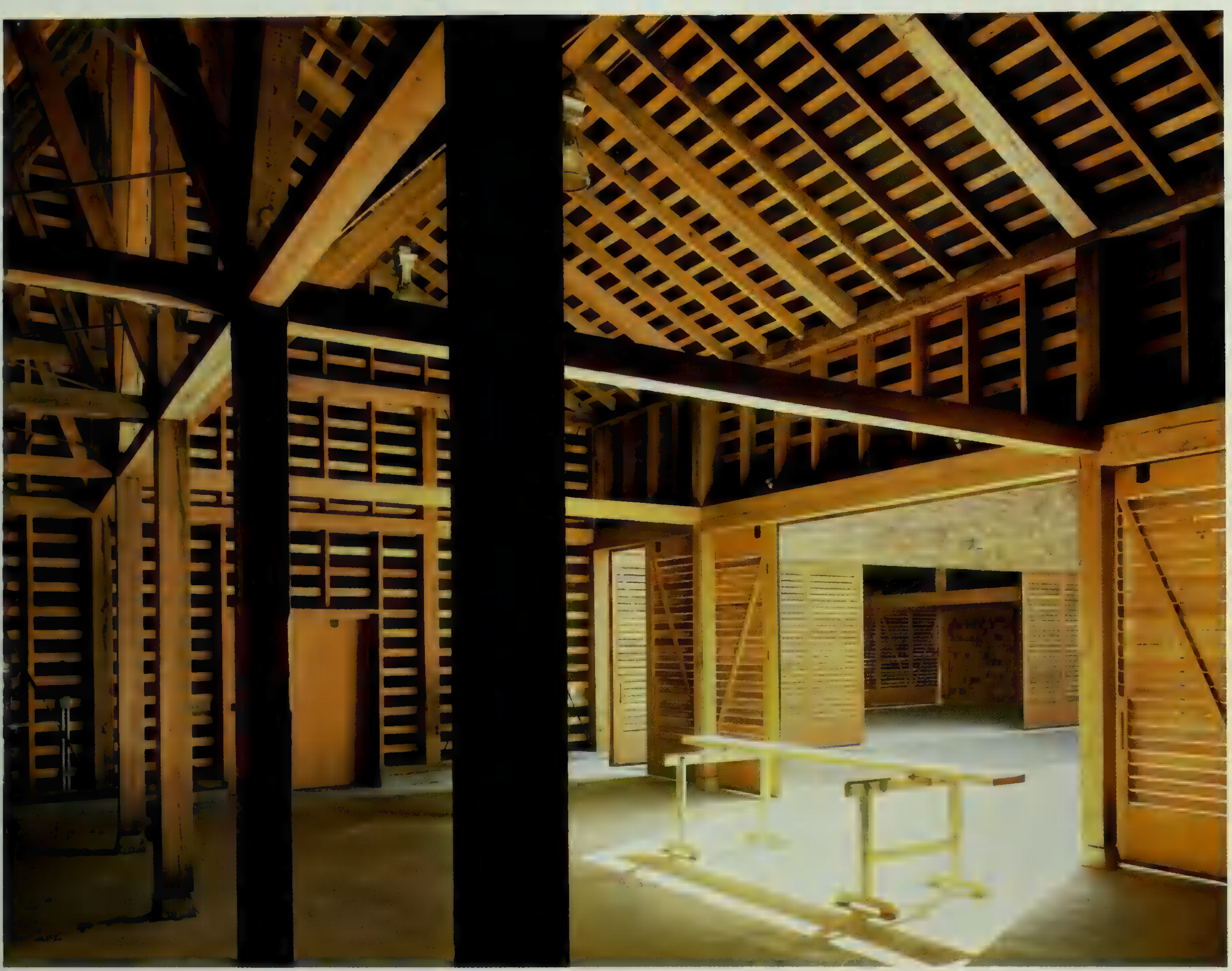
EXPLODED AXONOMETRIC

**"The only historic antecedents for this are covered bridges and Japanese temples," says contractor Steve Bobb, explaining Thompson and Rose's wooden kit-of-parts design (above). Sliding and swing doors faced with 1-by-4-inch red cedar slats open to the semi-enclosed courtyard. Steel pipes are imbedded in the chamfered concrete feet at the shop's perimeter. Timber framing in the wood shop is larch (right). Floors are pigmented poured-in-place concrete. Exterior siding is red cedar shingles, roofing is cedar shakes, and the gutters are copper.**



**The treelike structural exhibitionism of the wood shop (opposite) contrasts with what engineer Ben Brungraber calls the "deforested" truck storage bays (below and left).**

1. *Vet's station*
2. *Shop*
3. *Farm office*
4. *Equipment bay*
5. *Drive-through equipment bay*
6. *Storage*



the cedar slats and spotlighting the courtyard between the L-shaped structure and a low wood wall. "The forms are very connected to the topography," says Rose. "The building changes as it reveals itself," offers Thompson. "It's like a sleeping animal emerging from the earth."

To determine the structure of the shed's two wings, a wood shop and a garage, shop drawings went back and forth between Thompson and Rose and their structural engineer, Ben Brungraber. Larch was used for the more dramatic interior of the shop. It came from trees in Idaho that were killed in a forest fire 65 years ago, making it unusually dry, dense, and thus desirable, according to contractor Steve Bobb. In the shop, the architects decided to expose each layer of the structure, as if to glorify the process of construction for those who would eventually work in the 28-foot-wide, 40-foot-long, and 28-foot-high space. Black asphalt-impregnated felt—a building wrap and vapor barrier—shows between the post and infill framing. Even the steel rods, which were used to meet the 90-mile-per-hour wind-load resistance and seismic-zone 4 requirements, were threaded through the forest of beams as additional patterning.

And while there is an air of uniformity to the construction, the reality is more complex. "It was a difficult assembly, but I hope it doesn't look that way," says Bobb, explaining that there are 25 to 30 different types of joints in the space, none of which use nails. "It's exuberant, but structurally rational," observes Rose. "While it looks sculptural, every piece does work."

The structural challenges of the truck-storage bay were different, according to Brungraber. Since the architects refused to use plywood because the panels would interrupt the woven look of both interior and exterior surfaces, steel rods were inserted to bolster the roof. Though the garage is lower than the other wing (its roof peaks at 16 feet, 12 feet lower than the shop's roof), the effect of wind loads was complicated by the two long walls of sliding cedar-slat doors, which had to be reinforced. When the doors are opened, the building is transformed into a wooden frame for the landscape beyond.

The overall effect so intrigued a neighbor that she contrived a reason to get inside. Afterwards she wrote to the architects, commenting that the building "has its own identity, but it fits right in." Says the owner, in response, "Mission accomplished." ■

**Sources**

**Cedar-colored stains:** *Cabot*

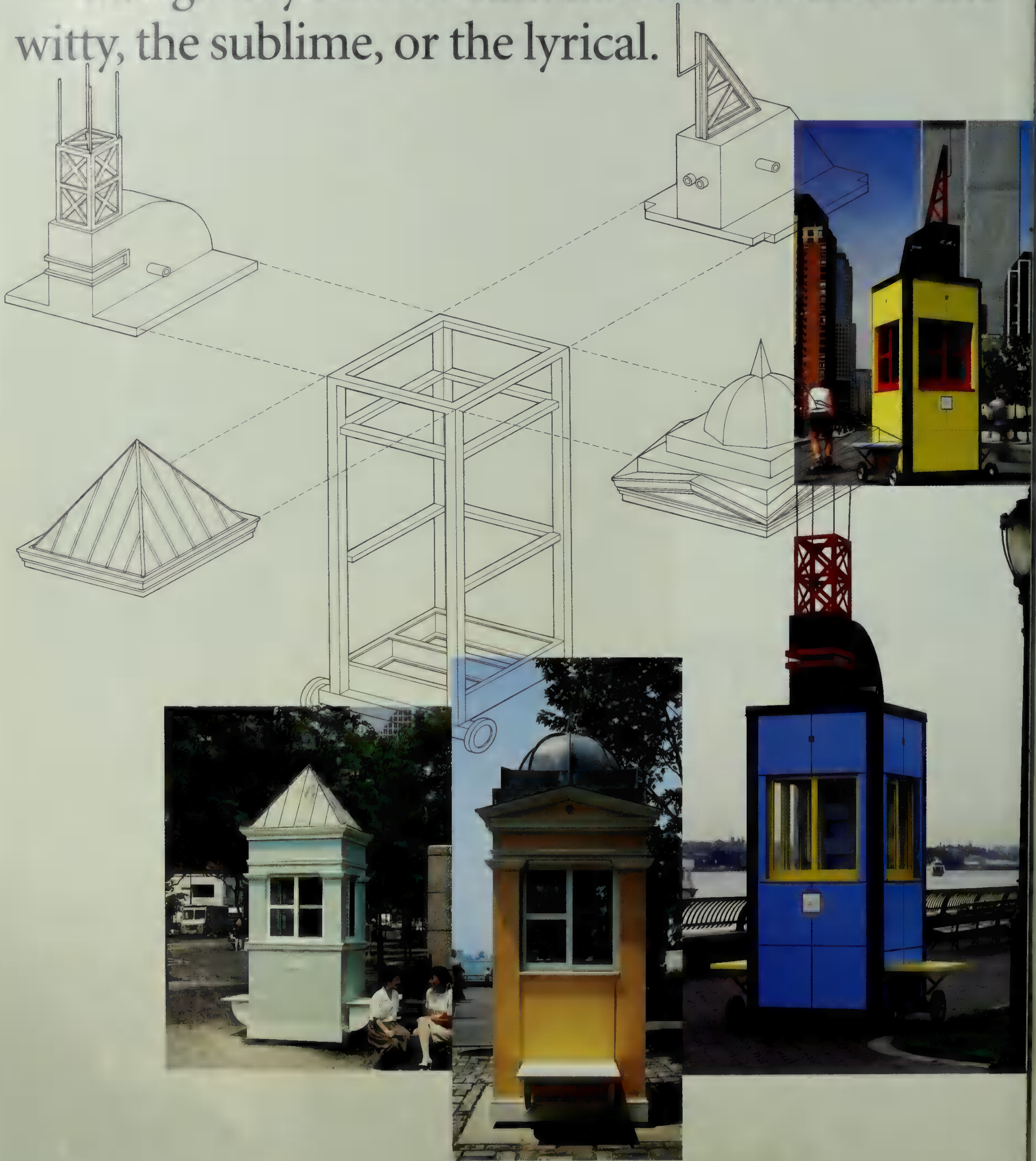
**Locksets:** *Schlage*

**Hinges:** *Stanley*

**Downlights:** *GE, Halo*

**Exterior lights:** *Poulsen*

# **SMALL PROJECTS** A portfolio of structures that go beyond the functional to reach for the witty, the sublime, or the lyrical.

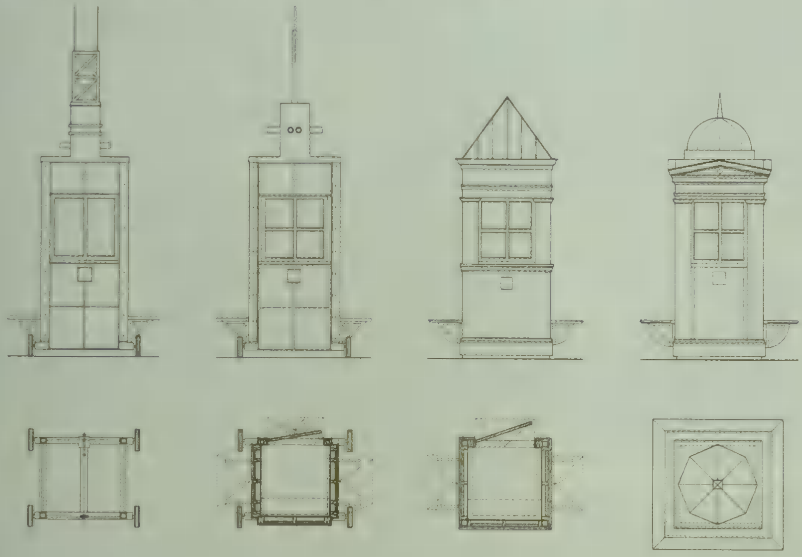


*A work of architecture can evoke as many emotional responses as there are people to experience it. After all we architects go through to design a building and then get it engineered, drawn, bid, and built, our most satisfying moments come when we see that we have elicited the intended response. This is what keeps us at the boards year after year.*

*I would describe my favorite kind of architecture as witty. Small projects like Alexander Gorlin's guard houses (below and opposite) seem to present especially wonderful opportunities for the injection of a little laughter. Gorlin grafted historic references, like temples and skyscrapers, onto structures so far removed in use and scale from the originals that if passersby don't smile at them, at least they will ponder them. I do not classify these designs as playful. (That word should be banned from architecture writing: buildings are not playful; puppies are.)*

*The old saw about humor—dying is easy but comedy is hard—applies to wit in architecture as well. I, for one, have had a much easier time being funny than doing architecture. So it stands to reason, by my logic anyway, that witty architecture would rate a much higher degree of difficulty than either comedy or architecture by themselves.*

*Complexity, too, plays a role in what I consider witty. The Grasshopper Bridge by artist Ed Carpenter (featured on page 113) appeals to me in a way that another of architecture's great witticisms, Philip Johnson's Duncan Phyfe–crowned Sony Building in New York City, never will. Why? The notion that a giant insect can safely carry children on its back across a dangerous place makes me think, and smile. On the other hand, the Sony Building seems to be a witticism based solely on scale. In my book, if you're going to build a joke that's 50 stories high, it should be more than a one-liner.* Charles Linn, AIA



BATTERY PARK CITY GUARD BOOTHS

## WHIMSICAL BOOTHS STAND GUARD OVER BATTERY PARK CITY

A quartet of fantastic portable guard booths, designed by architect Alexander Gorlin, have replaced the generic white booths originally installed in Battery Park City at the southern tip of Manhattan. They respond to the urban context of the adjacent financial district's hodgepodge of styles: earnest imitations of Greek temples, early steel frames dressed in Beaux Arts, neo-Gothic towers, and the oversize late Modernist gesture of the World Trade Center. Gorlin's nine-foot-tall guard booths, which mimic skyscrapers, robots, and Italian villas, take themselves less seriously, however. Their sober intent—to enhance public safety—is hidden behind their whimsy. Two booths recall the nostalgic classicism of the garden follies and tempietti that once graced the private parks of European nobility; the other two were inspired by the outrageous costumes and machines of Russian Constructivist stage sets.

The booths were constructed by a shipbuilder, which is fitting, since Battery Park City, like much of lower Manhattan, sits on land reclaimed from New York Harbor. *Andrea Truppin*

*Andrea Truppin is a documentary film maker and freelance writer who lives in New York City.*

**Project:** *Battery Park City Guard Booths, New York City*
**Owner:** *Battery Park City Authority*
**Architect:** *Alexander Gorlin Architect—Alexander Gorlin, AIA, principal-in-charge; Christian Dickson, project architect*
**Engineer:** *Eric Blohm*
**Builder:** *Derecktor Shipyards*

# NEW POOL COMPLEX PROVIDES COOL OASIS FOR MISSOURIANS

On a blazing hot summer day, few things are more satisfying than a dip in a cool swimming pool. But many residents of Sedalia, Missouri, where July temperatures can top 110 degrees, have been deprived of that distinct pleasure since the Liberty Park pool closed in 1992. Built as part of the Works Progress Administration initiative in 1937, the pool had far outlived its design life.

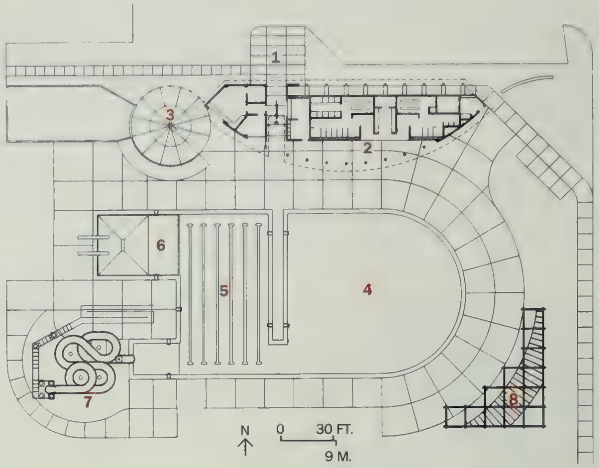
The city needed a new pool, and Shaughnessy Fickel and Scott Architects seized the opportunity to create much more than a place to swim. According to Mike Fickel, FAIA, principal-in-charge, "a swimming pool has to provide plenty of incentives and opportunities for entertainment."

Such was the thinking behind the Liberty Park Family Aquatic Center, a complex with numerous swimming and outdoor recreational features. The north elevation of the bathhouse is barracks-like, but its slanting, textured-aluminum roof, open on the south side to pick up breezes for natural ventilation, suggests that something special might be going on inside. The roof itself is supported by a rhythmic progression of concrete and painted steel columns, highlighted by criss-crossing steel cables. These elements also ornament the complex's visual focal point, an outdoor eating pavilion shaded by a tensile fabric structure whose spiraling form resembles a nautilus shell. A shade structure made of wood slats and grass decks provides additional space for lounging. "Rather than a single static structure, we wanted to create a set of dynamic spaces that would accommodate a variety of activities," explains Fickel. "Each element is a place where people congregate and have fun."

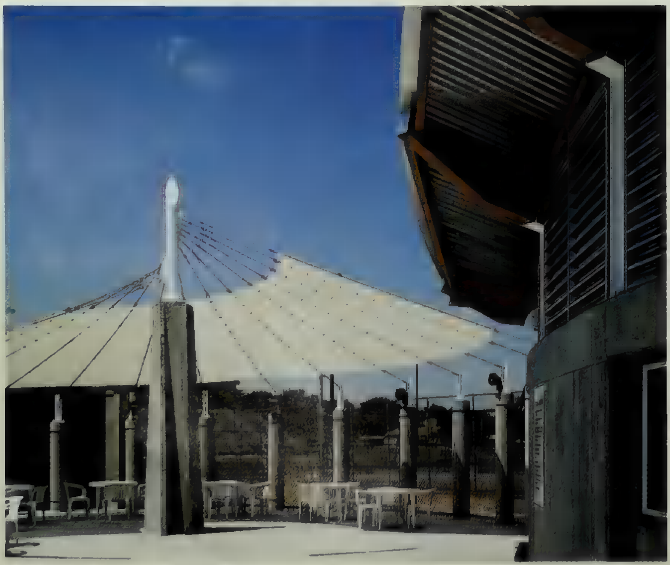
The pool includes a one-meter diving well, a spiraling water slide with a plunge pool, six 25-meter competition lanes, a shallow area, and a zero-depth entry with water-play features, such as water-spouting columns.
*Elizabeth Harrison Kubany*

*Elizabeth Harrison Kubany received a master's degree in architectural history and theory from the Architectural Association in London.*

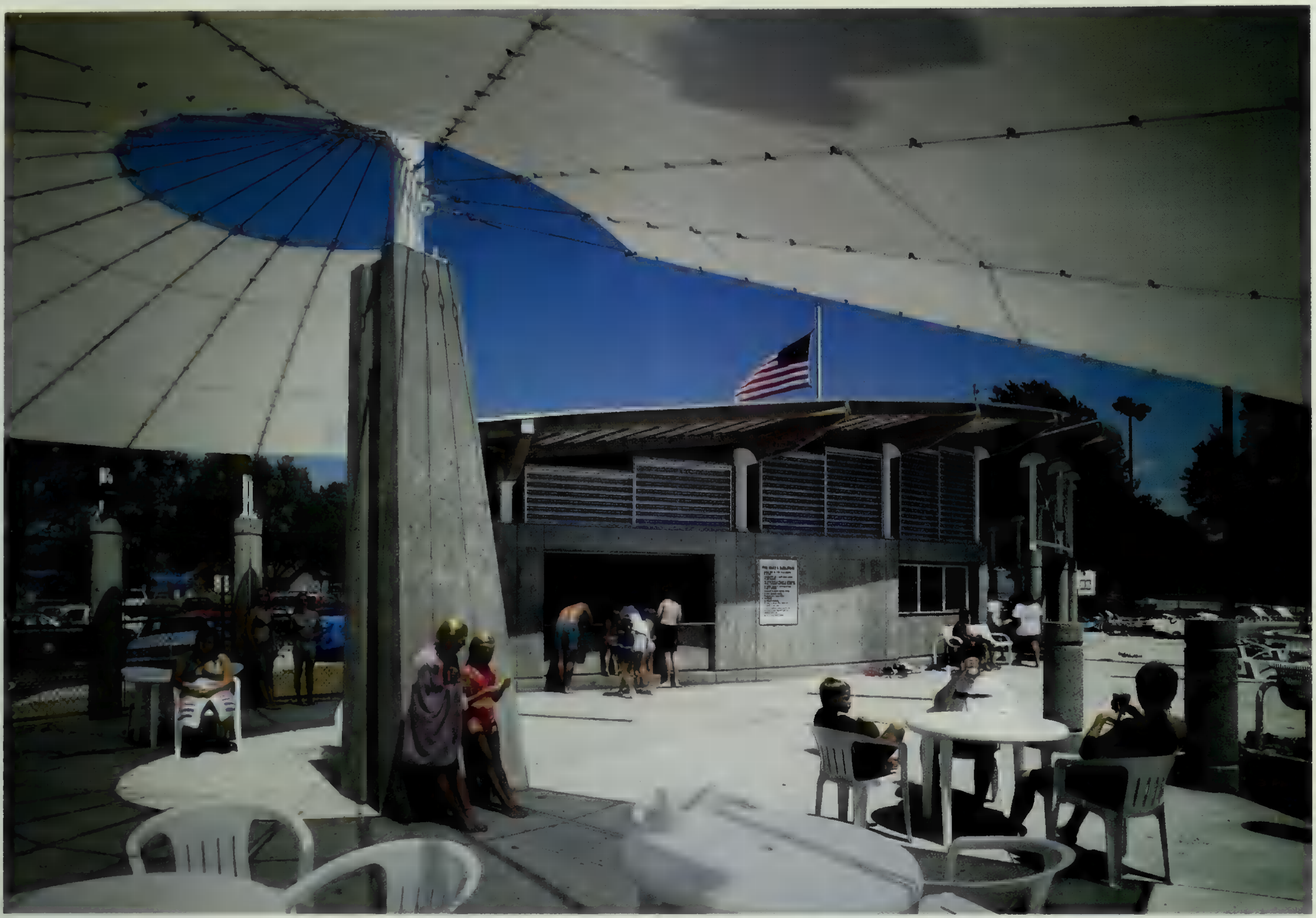
**Project:** *Liberty Park Family Aquatic Center, Sedalia, Missouri*
**Owner:** *City of Sedalia*
**Architect:** *Shaughnessy Fickel and Scott Architects—Mike Fickel, FAIA, principal-in-charge; Kerry Newman, project designer*
**Engineers:** *Larkin Aquatics (pool design); Kerr Conrad Graham Consulting Engineers (structural)*

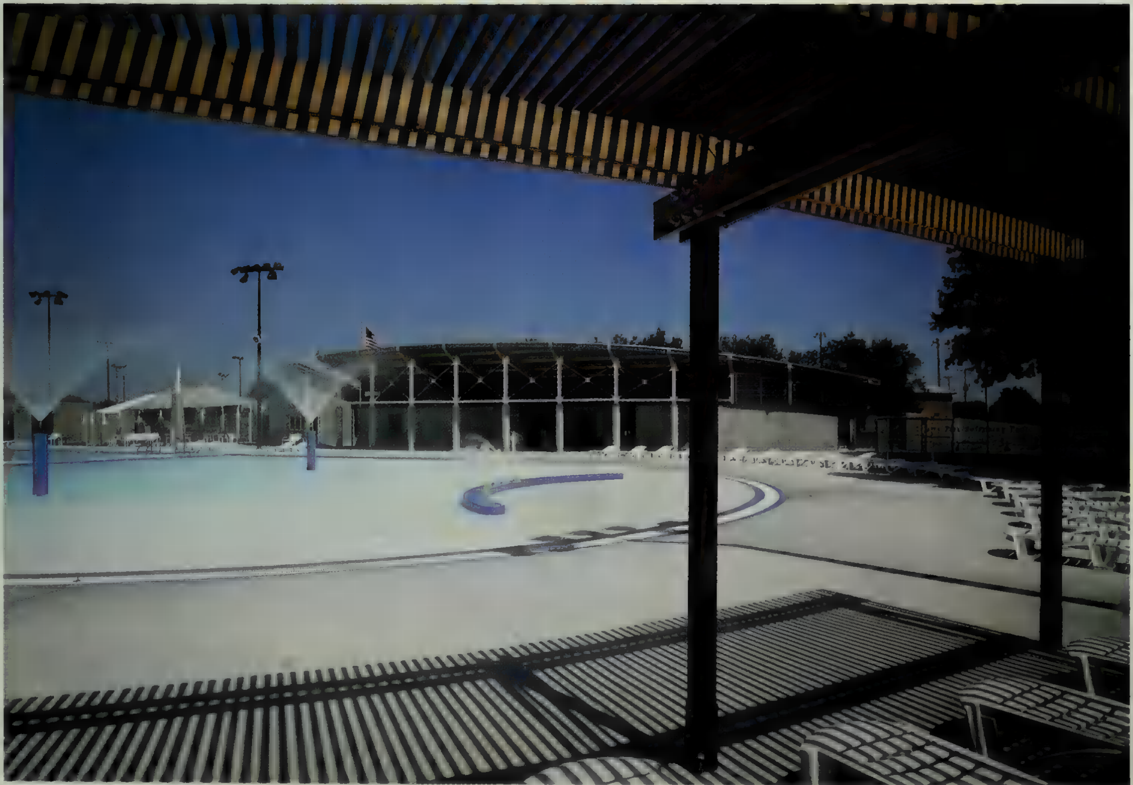


1. *Entry*
2. *Locker rooms*
3. *Tensile sunshade*
4. *Wading pool*
5. *Lap pool*
6. *Diving pool*
7. *Water slide*
8. *Trellis sunshade*



**The raised, sloping metal bathhouse roof is open on the south side of the building to allow cool breezes to enter (left and above). The tensile fabric-covered picnic shelter (left and opposite top) is shaped in a spiral, somewhat like a nautilus shell.**





**The shallow end of the pool (left) has special features, including two water-spouting columns and a crescent-shaped concrete bench that sprays water into the air. The south elevation of the bathhouse can be seen in the background.**

# CHICAGO SUBWAY STOP EXEMPLIFIES VIBRANT PUBLIC ARCHITECTURE

In the realm of public architecture, everyday, much-used structures face the most rigorous tests of function, durability, accessibility, and aesthetics. Successful examples address all four concerns. Respectful of precedent without veering toward pseudohistorical redundancy, the Blue Line subway stop at Wells and Lake Streets represents the vibrancy of Chicago public architecture.

Thomas Hoepf, AIA, of the Chicago firm Teng & Associates, designed the refurbished three-level station. Immediately accepted by the public and the design community, it has been adopted by the transit authority as a prototype for city subway stops.

Hoepf says his own experiences as a subway rider influenced the design. "This stop used to be depressing, dark, and damp," he says. "And it looked dangerous."

As the initial step in the design process, the architect looked at entrance canopies around Chicago, Paris, and New York City and considered the neighborhood context. "We wanted to incorporate the historical form, but in a modern interpretation—not a replication," Hoepf says.

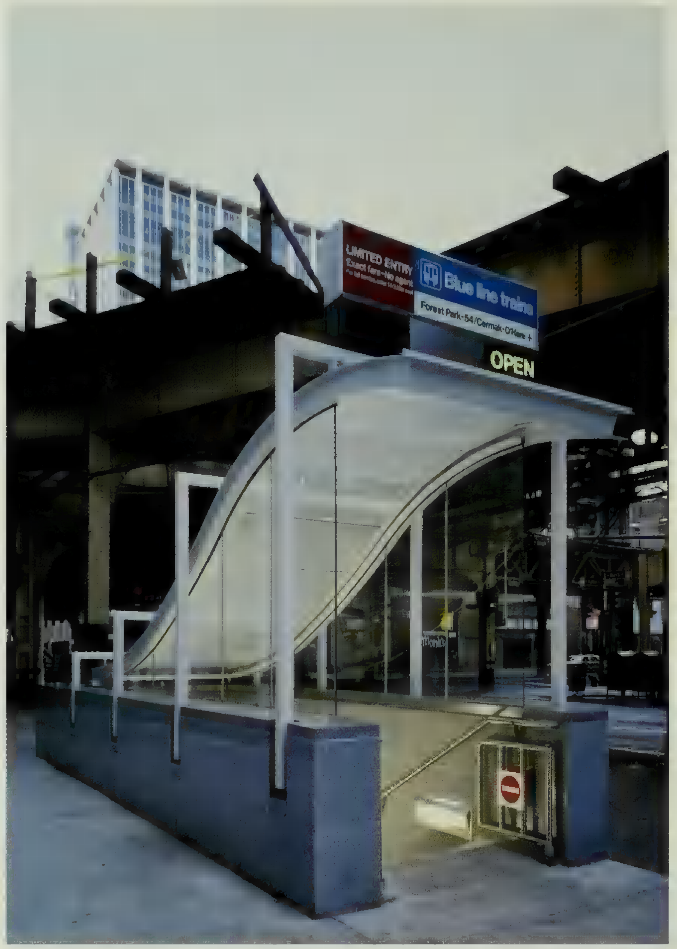
The fluid roof form lends itself to the motion of descent, and the station's site under the elevated-train tracks also became a point of reference. The canopy's upside-down, U-shaped steel columns reiterate the structure of the el.

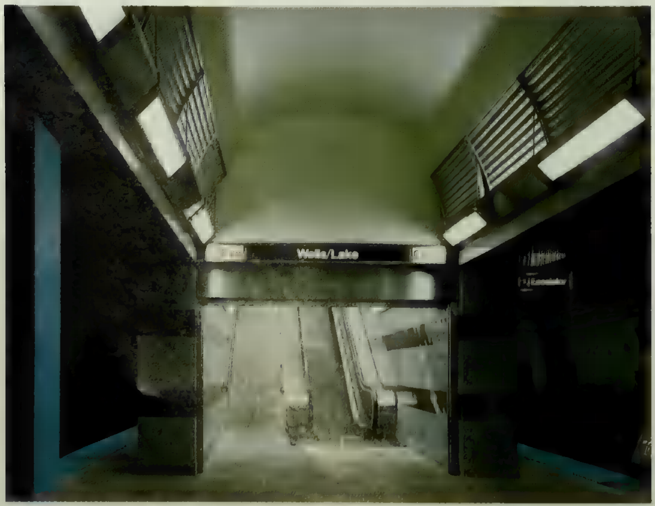
Above ground, Hoepf specified granite as the architectural and aesthetic base for the jewel-like structure. Glass for the walls and roof protects riders from the weather without blocking scarce natural light. Attention to detail continues below. At the mezzanine level, Hoepf repeated the granite as dark and light bands to allude to the strata of the earth.

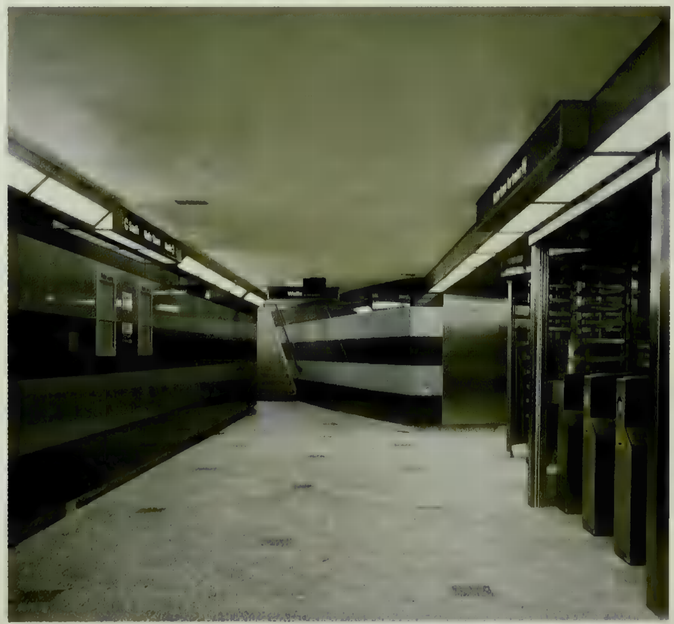
Carefully matched caulking provides visual continuity as a calm counterpoint to the visual chaos of mass transit. The same uncluttered treatment is evident at the lowest boarding levels, where Hoepf worked with engineers to consolidate all the necessary utility and mechanical conduits inside sleek corrugated metal panels. *Linda Hallam*

*Linda Hallam edits shelter books for the Meredith Corporation.*

**Project:** *Chicago Transit Authority Wells/Lake Subway Station, Chicago*
**Owner:** *Chicago Department of Transportation*
**Architect:** *Teng & Associates—Jerry Cibulka, AIA, principal-in-charge; Thomas Hoepf, AIA, principal design architect; David Stuhlmacher, AIA, project manager*
**Engineers:** *d'Escoto (civil); Teng & Associates (structural and electrical); T&M Associates (mechanical)*







**The glass walls and roof of the subway station at Wells and Lake in Chicago allow a generous amount of daylight into the subway station itself (left). Light and dark granite bands (above) allude to the strata of the earth.**

## NAUTICAL-THEMED BRIDGE IS PLEASING TO DRIVERS AND PEDESTRIANS ALIKE

Bridges offer architects the opportunity to marry traffic functions with memorable aesthetics. In the new Main Street Bridge over the Root River in Racine, Wisconsin, designed by HNTB Architects Engineers Planners of Milwaukee, that union is a happy one.

For transportation improvements, the new bridge, supported by piles, accommodates four full 12-foot-wide traffic lanes, instead of the 10-foot lanes of the old 1927 bridge. Equally important, vertical clearance has been increased from 8 to 16 feet, allowing many more boats to safely pass underneath and reducing traffic disruption when the spans are opened for taller boats.

Though only one tower was needed to house the bridge operator, HNTB's plan features two towers and two pedestrian overlooks at opposite ends of the 294-foot-long span to balance the design of the bridge. In keeping with the maritime ambience of the riverfront, HNTB chose rusticated bases of hand-rubbed concrete, solid bronze waist louvers and gutters, and naval glass accents that allude to lighthouses.

The bridge also has a pleasant pedestrian aspect. It is placed in a parklike setting, and the circular overlooks opposite each tower give walkers views of downtown, the lakefront, the marina, and scenic residential areas. *L.H.*

**Project:** *Main Street Bridge, Racine, Wisconsin*
**Owner:** *Wisconsin Department of Transportation*
**Architect:** *HNTB Architects Engineers Planners*

**As the bridge towers' copper-clad roofs age to a green patina (above), they will echo other spires in Racine.**

**Phoenix's Grasshopper Pedestrian Bridge (below) is decorated with silhouettes of scorpions and snakes.**

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## GIANT GRASSHOPPERS CARRY PHOENIX CHILDREN SAFELY ACROSS STREAMBED

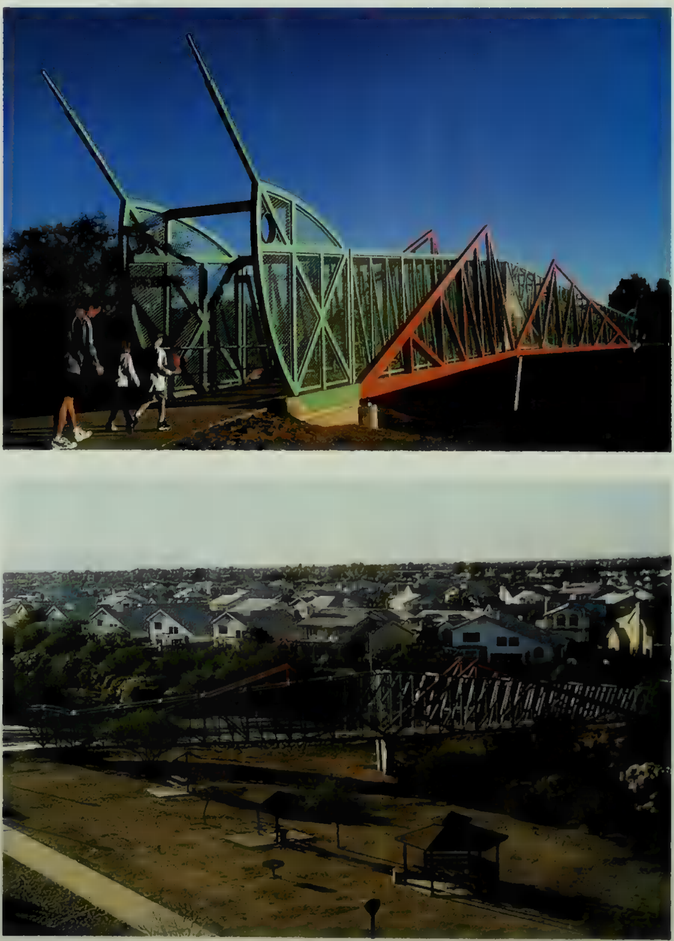
The East Fork Cave Creek in north Phoenix's Moon Valley neighborhood is normally a dry wash. But the thunderstorms that occasionally rumble through the desert can turn Cave Creek into a raging river without warning in a matter of seconds.

Because the threat of a surprise flood presents a real danger to children passing through the area on their way to school, who are tempted to try and wade across the creek, Gail LeBrun, a neighborhood resident, asked the city to build a pedestrian crossing over the streambed. City officials responded in typical Phoenix fashion by soliciting artists for an innovative solution to their infrastructure problem. Backed by Moon Valley residents, who helped in the selection process, the city awarded the commission to Ed Carpenter, an artist from Portland, Oregon.

Throughout the process of creating and building the Grasshopper Pedestrian Bridge, Carpenter worked closely with the surrounding community, as well as Phoenix's Street Transportation Department and its Arts Commission, to arrive at imagery that would be appropriate for and appealing to youngsters. The final design—a pair of giant grasshoppers waiting to transport the children safely across the wash—refers to the Sonoran desert without resorting to cactus clichés.

Local engineer Jerry Cannon, of Cannon Associates, was instrumental in realizing the 210-foot-long steel bridge. And students in art classes at the middle school nearby made a significant contribution: they worked with Carpenter to create insect silhouettes, which were made into templates used to sandblast designs into the bridge's concrete deck. *C.L.*

**Project:** *Grasshopper Pedestrian Bridge, Phoenix, Arizona*
**Owner:** *City of Phoenix*
**Artist:** *Ed Carpenter*
**Engineer:** *Cannon Associates—Jerry Cannon*
**Metal fabrication:** *Sandvick Equipment and Supply*



# DELICATE OBELISK SHIMMERS ABOVE WHITE SANDS OF FLORIDA'S SEASIDE

The Coleman Pavilion in Seaside, Florida, pays homage to one of the earliest forms of architecture: the monument. The 50-foot-high, broadly proportioned obelisk straddling the dunes marks the boundary between the town and nature, a sweep of white sand along the azure waters of the Gulf of Mexico.

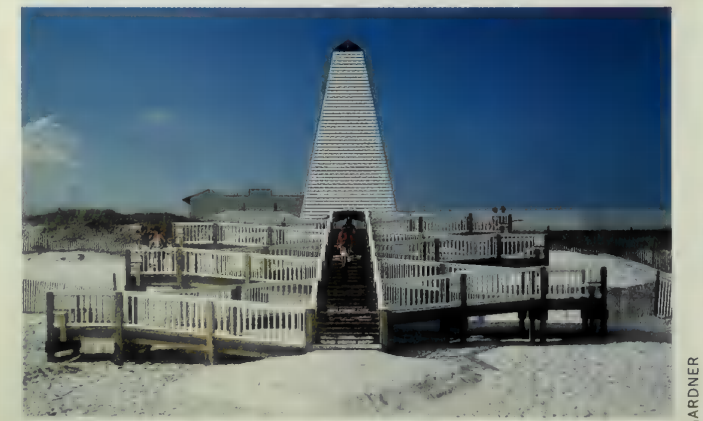
As a symbol for Seaside, the well-known 80-acre planned community in the Florida panhandle, architect David Coleman decided that the obelisk should embrace all the community's eclectic styles without referring directly to any of them. His subsequent search for what he calls an "elemental form" led him to ponder the power of ancient monuments, such as Mayan temples. His pavilion, towering over nearby buildings and topped with a pyramidal copper cap, suggests a Celtic menhir, a Chinese pagoda, a New England lighthouse, and an Egyptian pyramid. It also contrasts opposites such as opaque/transparent, solid/porous, inside/outside, and light/dark to provoke perceptual shifts and ambiguities that engage both mind and body.

Seen from the center of town, the obelisk appears solid and heavy, its shape suggesting stone. But on approach, it reveals itself as wood, its surprising delicacy enhanced by open joints between the horizontal slats cladding the skeletal frame. The wide-skirted structure hovers lightly on the toes of its four king rafters over four arched openings, but the arches are so broad and shallow that they appear to be flattened by an immense weight.

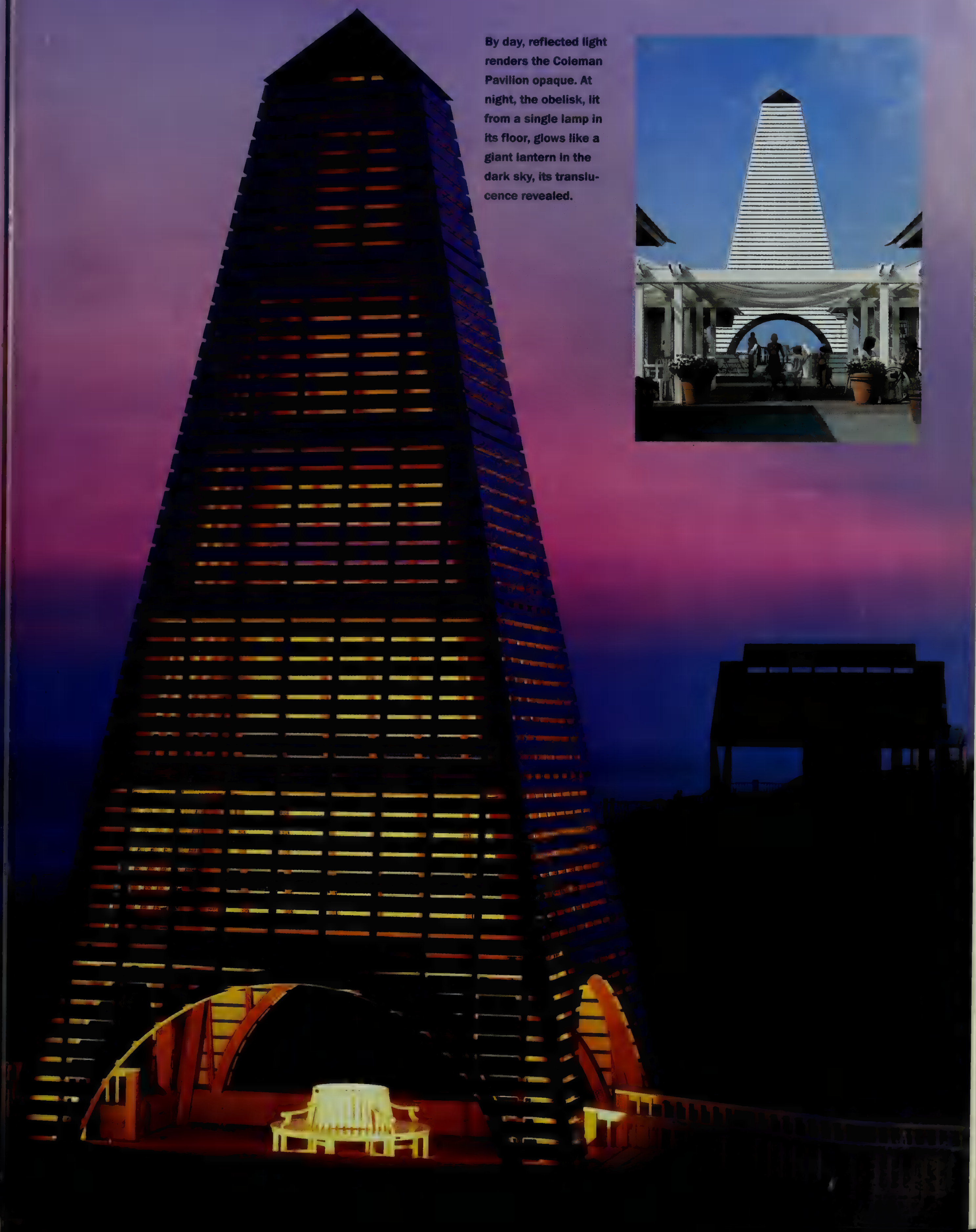
A circular bench, from which one can observe a 360-degree view through the arches, provides a humanely scaled place of repose. Wheelchair access to the beach is via a series of switchback ramps that suggest processional movement. These long, gently sloping paths have become a favorite destination for socializing and watching the sunset.

A couple of years ago, the pavilion stood fast against a major hurricane, earning itself a modest place among the timeless monuments of old. *A.T.*

**Project:** *The Coleman Pavilion, Seaside, Florida*
**Owner:** *Seaside Community Development—Robert Davis, president*
**Architect:** *David Coleman/Architecture*
**Engineer:** *Johnson, Creekmore, Febre—Sam Johnson*



PHOTOGRAPHY: © JACK GARDNER



By day, reflected light renders the Coleman Pavilion opaque. At night, the obelisk, lit from a single lamp in its floor, glows like a giant lantern in the dark sky, its translucence revealed.

# TWO HALVES MAKE A WHOLLY PLEASANT CARPORT-GREENHOUSE COMBO

"When our client returned the first time, he sounded almost apologetic," recalls architect Max Levy, AIA, of Dallas. "He said that he was getting on in years, and he had always wanted to build something but never had. He wondered if we would design a carport and a greenhouse for his backyard."

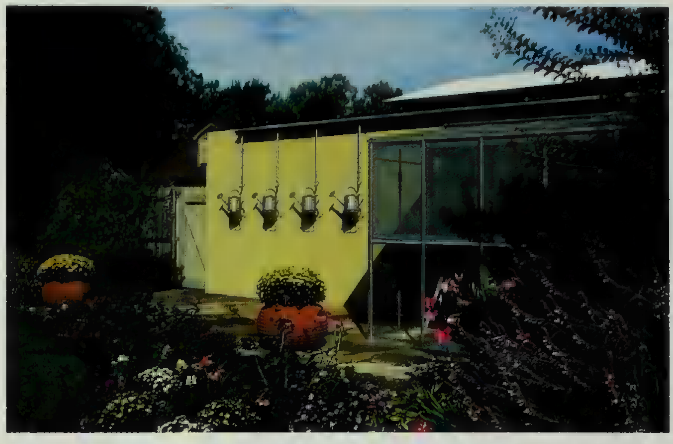
When Levy visited the site, he found a quaint 1920s bungalow in perfect condition fronting a backyard that the client, who raised his own flowers, had planted as a miniature English garden. The only problem was that to build both a greenhouse and a carport behind the house would mean sacrificing a good deal of the space occupied by the garden.

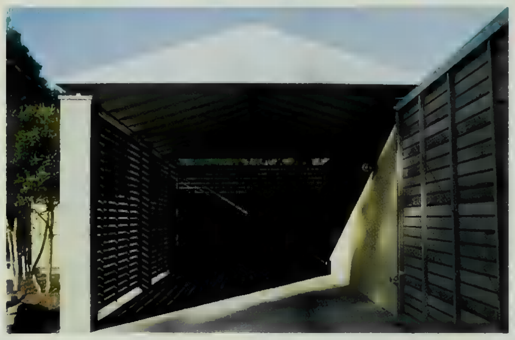
Levy proposed that the carport and greenhouse be combined into one structure. The carport would be just wide enough for the car, and the attached conservatory would be a half-section of a premanufactured greenhouse. The client agreed.

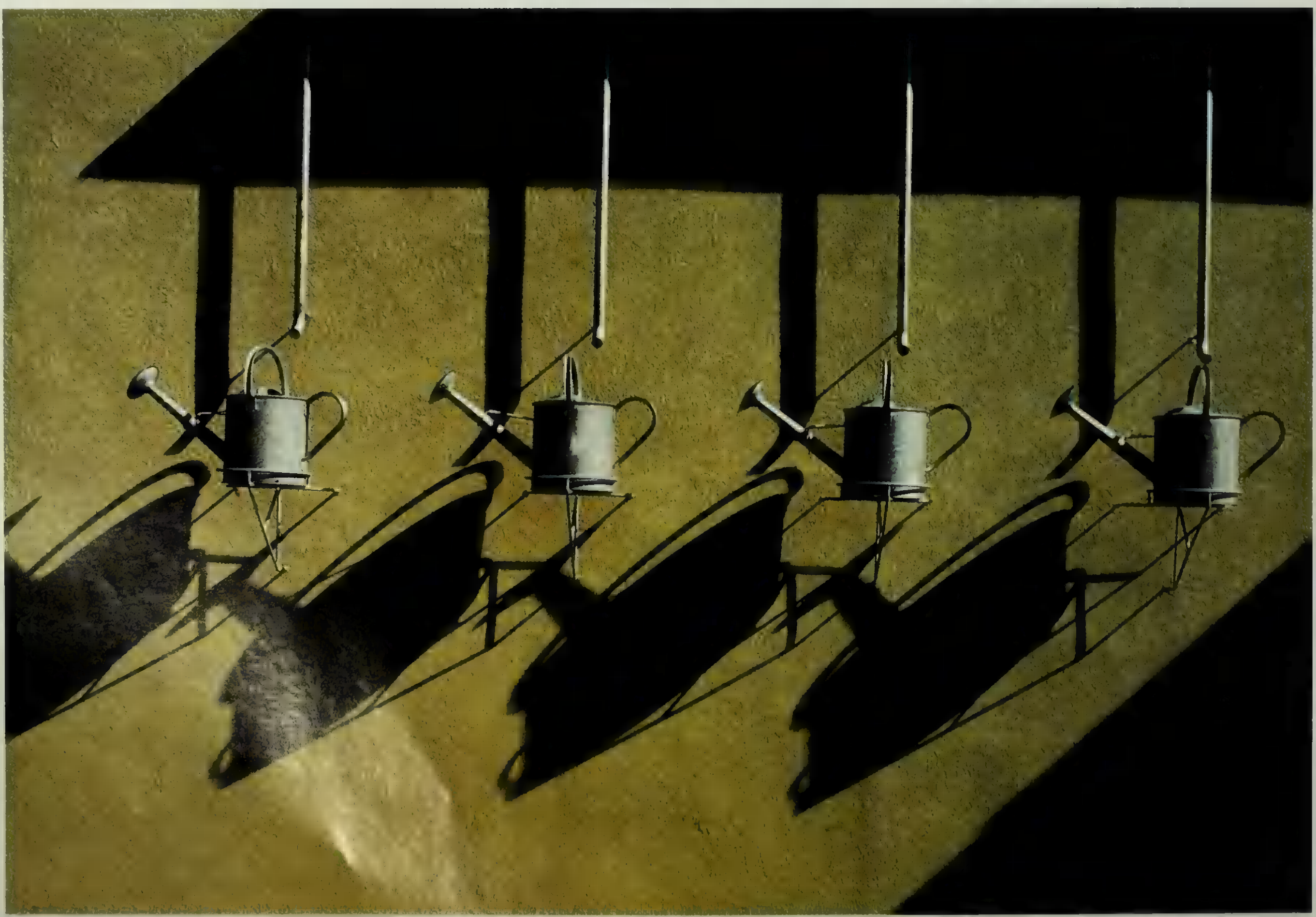
The carport's roof skin is made of translucent, synthetic canvas. "I think a carport should be as welcoming and pleasant as an entry hall, since it's the first thing you see when you're coming home," says the architect.

The roof's gutters and downspouts drain into several watering cans the client bought on a visit to England. He uses the collected rainwater in the garden. Even this tiny project afforded designer and client the chance to explore green architecture. "Every building should give something back to the earth," Levy says. *C.L.*

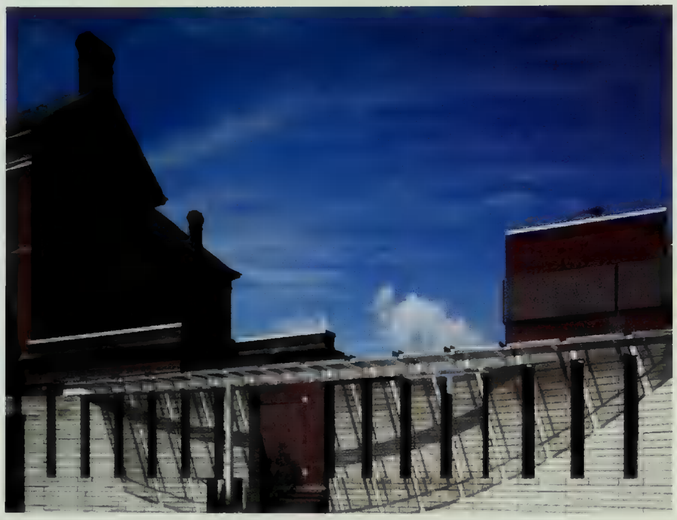
**Project:** *Carport and Greenhouse, Dallas*
**Architect:** *Max Levy, AIA*







# PLAZA AND FREE SPEECH WALL TAKE CENTER STAGE ON IOWA CAMPUS



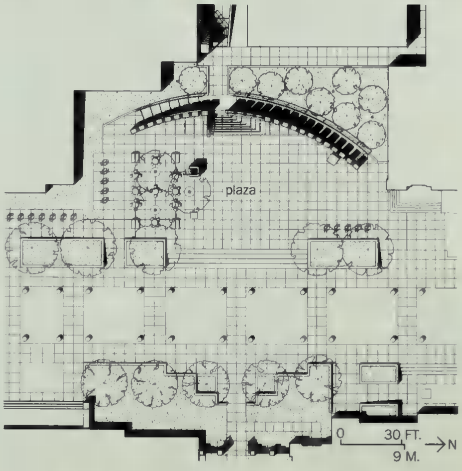
The Kautz Plaza/Free Speech Wall, at the University of Iowa in Iowa City, sits on a triangle of land left over after a new pedestrian street was installed, but it functions as if it were integral to the original design. Designed by Herbert Lewis Kruse Blunck Architecture and developed by principal Rod Kruse, FAIA, and project architect Paul Mankins, AIA, the plaza consists of a simple concrete slab and a limestone wall. It provides space for formal and informal outdoor gatherings.

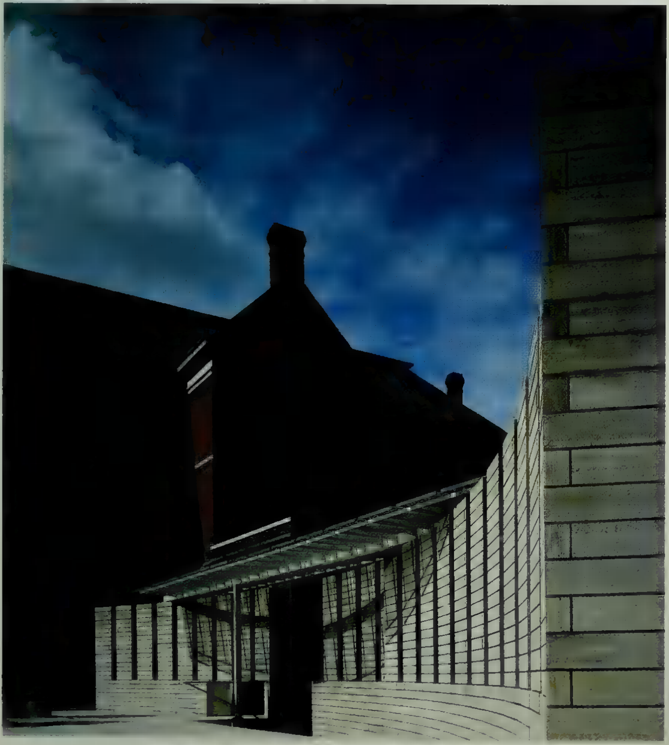
The pedestrian street links the Pentacrest, the academic center of the university, with other major buildings, placing the Kautz Plaza at the heart of campus life. Mankins notes that buildings to the west of the curving yellow limestone wall are brick and those to the east are limestone. The wall is the line between the two, although it establishes definable spaces on either side.

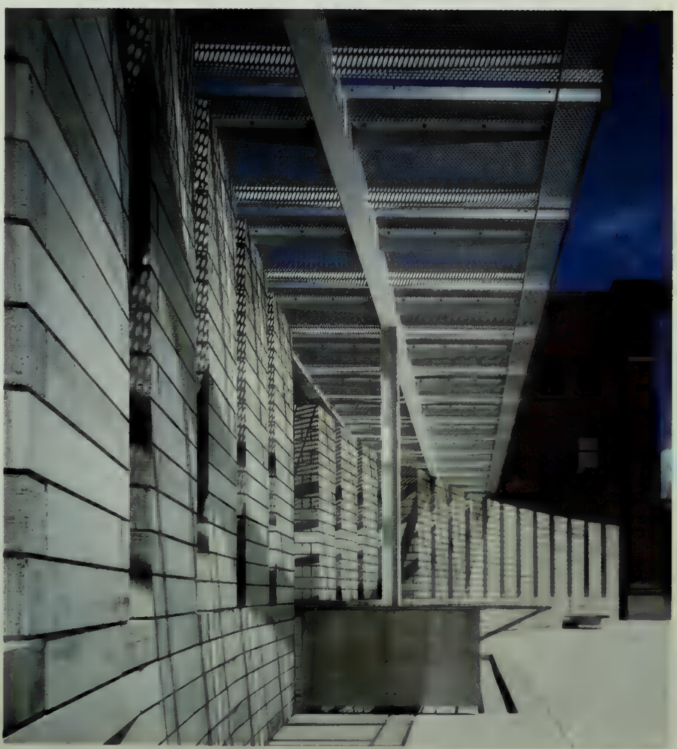
The limestone was taken from the same Indiana quarry as the stone used for Frank Gehry's Advanced Technology Laboratory building, which is located on the campus nearby. It was cut and laid like bricks, to suggest both the stone and brick of nearby buildings. The south half of the plaza was developed for use with tables and benches, with space for street vendors. The plaza's north half serves as a gathering point for speakers, and a platform supported by the wall calls out to orators who wish to exercise their right to free speech.

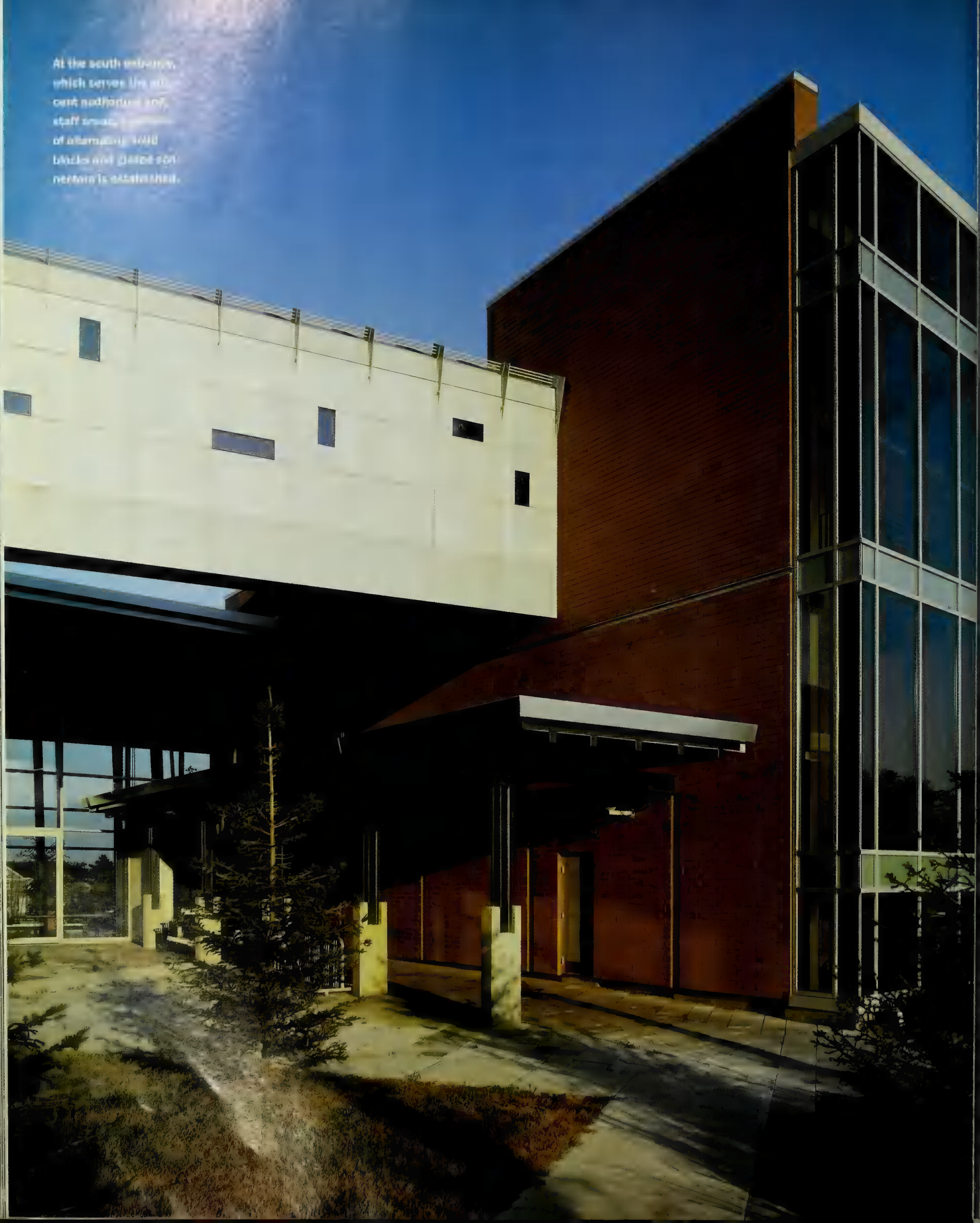
The wall is topped by a perforated stainless-steel canopy. Its leading edge is straight rather than curved like the wall, casting patterns of shadow and light that change throughout the day. Beams of light also penetrate a series of narrow, seven-foot-high slits in the limestone walls. Uplighting inside the slits softens the wall's character at night and illuminates the plaza. *L.H.*

**Project:** *Kautz Plaza/Free Speech Wall, University of Iowa, Iowa City*
**Architect:** *Herbert Lewis Kruse Blunck Architecture—Rod Kruse, FAIA, partner-in-charge; Paul Mankins, project architect/designer*
**Consultants:** *Shive Hattery (structural, electrical); Crose Gardner (landscape architecture)*





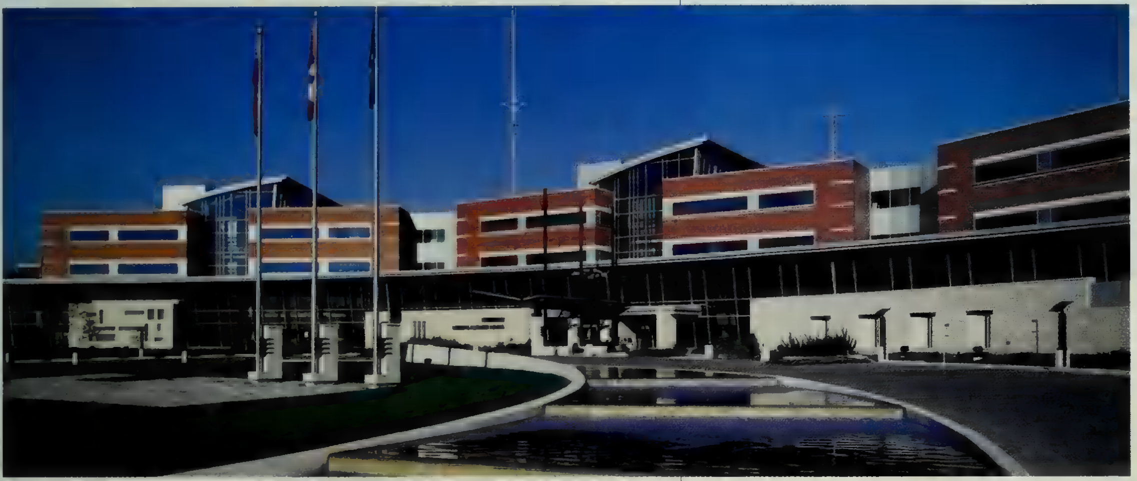




At the south entrance, which serves the adjacent auditorium and staff areas, a pattern of alternating solid blocks and glazed connectors is established.

# Inviting the public inside, the **ONTARIO PROVINCIAL POLICE HEADQUARTERS** offers openness without sacrificing security.

**by Beth Kapusta**



**The project's basic organization is easily read by visitors arriving at the forecourt: office blocks with generously glazed atria sit behind a curving, glass-fronted indoor "street" linking all public components.**

As the public's taste for megabuildings wanes, the need for big centralized institutions remains. Such was the dilemma facing the Ontario Provincial Police (OPP), which wanted one complex, encompassing some 572,000 square feet of space, to consolidate eight facilities previously located all across Ontario. Given a 60-acre rural site bounded by a stand of hardwood maple trees on one side and sensitive wetlands on the other, a pair of Toronto-based architecture firms was asked to design a very big building to be the headquarters of Canada's largest provincial police force.

The big building is not something the current generation of architects has done particularly well in Canada. An earlier generation—including Ron Thom at Trent University, John Andrews at Scarborough College, and Arthur Erickson at Simon Fraser University—adeptly wove together the contradictions of landscape and large buildings to create uniquely Canadian responses that captured the optimism and unselfconscious expression of the time. But today such grand gestures tend to come across as unflattering examples of megalomania.

## Learning from others' mistakes

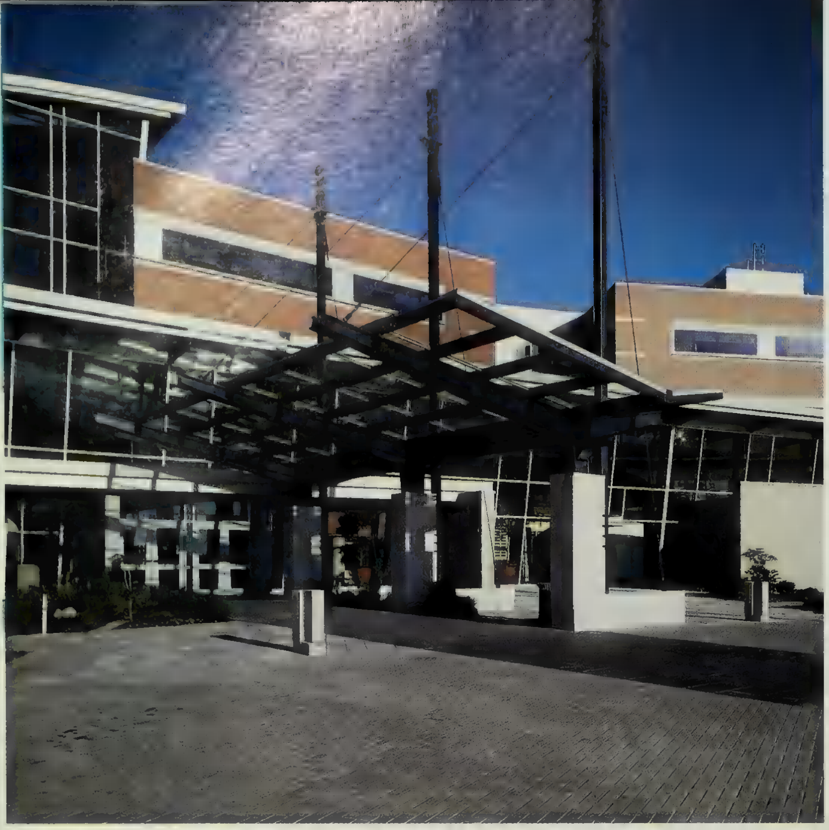
History already provided a lesson in what could go wrong with an overly grand law-enforcement building. Several years ago, when the metropolitan police of Toronto erected an impenetrable granite fortress as their headquarters, the public hue and cry made it clear that such excessive, megalithic edifices don't help bolster the police force's image in the eyes of the public.

And so the OPP headquarters, designed by Dunlop Farrow Inc. Architects and W. M. Salter Associates (working as a joint venture) came to be defined by a series of near-contradictions: value without opulence; considerable size without intimidating scale; openness without compromised security; coherence without oversimplification. The desire to be seen as a community-based police force serving both rural and urban constituencies prompted the OPP to choose this site just outside Orillia, a large town located near the center of the province but just off a major highway that runs north from the city of Toronto.

Much of the program required very high security. But a desire

*Beth Kapusta is a Toronto-based freelance journalist and an adjunct professor at the University of Waterloo School of Architecture.*

**Project:** *Ontario Provincial Police Headquarters, Orillia, Ontario*
**Architects in joint venture:** *Dunlop Farrow Inc. Architects/W. M. Salter & Associates—Douglas Neville, W. M. Salter, principals-in-charge; Michael Moxam, Christian Klemt, Tye Farrow, John Jeffery, Gerry Pilon, project architects; George Bitsakakis, Robert Boraks, Janice Brown, Robert Chang, May Chow, Steve Clishe, Dede Dorsey, Janet Gasparotto, Agnieska Gontarz, Barbara McLean, Barbara Miszkiel, David Morgan, John Persano, Alan Power, Todd Scott, Mira Sener, Colin Tennent, Jim Tushingham, Grant Wilder, Miranda Wong, Robert Wu*
**Engineers:** *Carruthers & Wallace (structural); Skelton, Brumwell (civil)*
**Landscape:** *EDA Collaborative*
**General Contractor:** *PCL Constructors Eastern, Inc.*



The main entrance to the headquarters is marked by a metal-and-glass canopy (above). Public elements such as the library (right, top and bottom) are pulled out and treated sculpturally. Landscaping around the site was inspired by existing wetlands and old-growth trees.

for openness and accessibility was one of the main requests to emerge in the numerous client focus groups that were part of the design process. These potentially conflicting requirements were resolved in a plan that locates the public elements along a glazed two-story indoor "street" anchored at one end by a day care center and at the other by a research library. Publicly accessible program elements such as an auditorium (for press conferences and training sessions), a gift shop, a museum, and a cafeteria are all articulated as distinct volumes off the curving spine.

> **EVEN AS THE PUBLIC'S TASTE FOR MEGABUILDINGS WANES, THE NEED FOR BIG INSTITUTIONS REMAINS.**

According to Michael Moxam, one of the project architects, the architectural strategy was rooted in the idea of an "open, accessible image—a large part of which is about transparency." To this end, the glazed wall of the indoor street is canted to maximize transparency during the day, and it looks onto the project's circular entry court (which doubles as a ceremonial space).

A sense of light and warmth is expressed in the curving public space in a rich palette of materials: tapered steel columns, Tyndall stone (a limestone that is remarkable for its high fossil content), and dark gray terrazzo irregularly divided to simulate a stone patchwork. The materials are durable, yet they are used in such a way as to wipe away any institutional trace. Some of the slicker materials of the early design were purposely dropped to avoid any semblance of ostentatiousness and were replaced with simple but elegant staples like masonry and judiciously used maple panels.

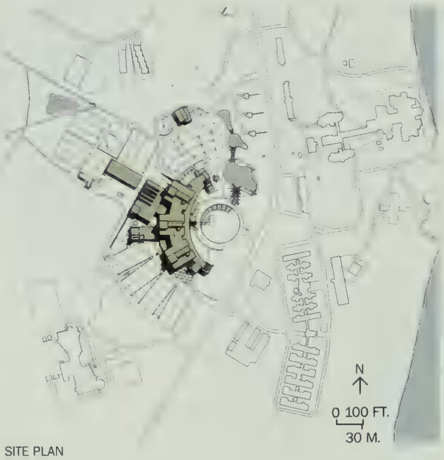
### Holding down the budget

Even with the budget for the building ending up at only $70 per square foot, Moxam says there is the occasional complaint that the headquarters "looks too good." The fact that the project was undertaken in the middle of the last recession was a big help in achieving such value, explains Moxam. In addition, the architects kept costs down by using a fairly limited palette of materials and making the most of repeated elements.

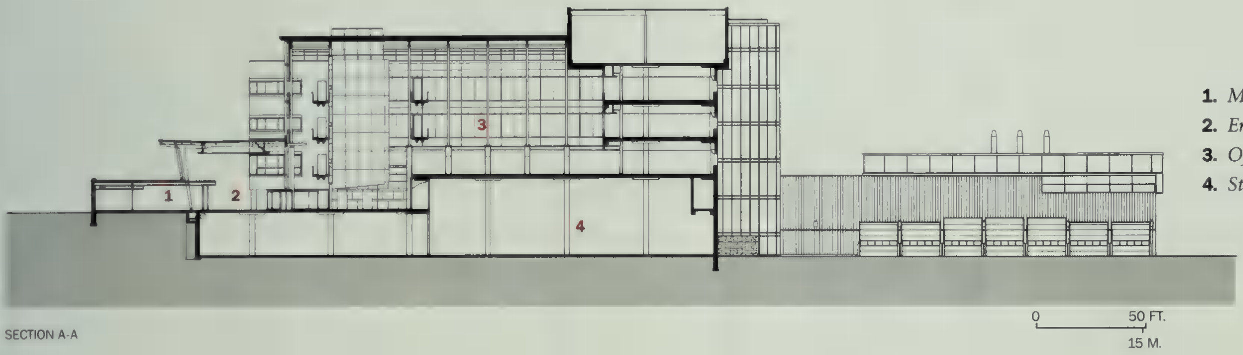
The building's planning strategy is based on surrounding an open core with a secure periphery. The publicly accessible zone is the inner ring of the radial plan, to which the more secure program elements are visually connected but not physically accessible. Atria bridge the gaps between four-story brick office blocks. The two-story mass of the glazed street tempers the scale of the higher office volumes beyond.

A secure internal street connects the atria, each of which is capped by a tilting arched roof and lit by north-facing clerestory windows. A third ring extends out beyond the office/atrium blocks, comprising the shedlike, metal-clad forms that contain *(text continues)*

**The police headquarters sits on a 60-acre site that slopes down to the north, allowing the architects to tuck a large service garage behind the main building (section and plans below). Other facilities such [illegible] an emergency operations center (including a helipad), a canine training center, and a rifle range are located on distant parts of the site.**

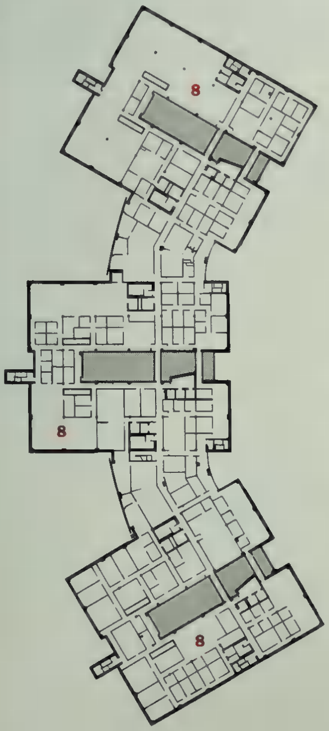


SITE PLAN

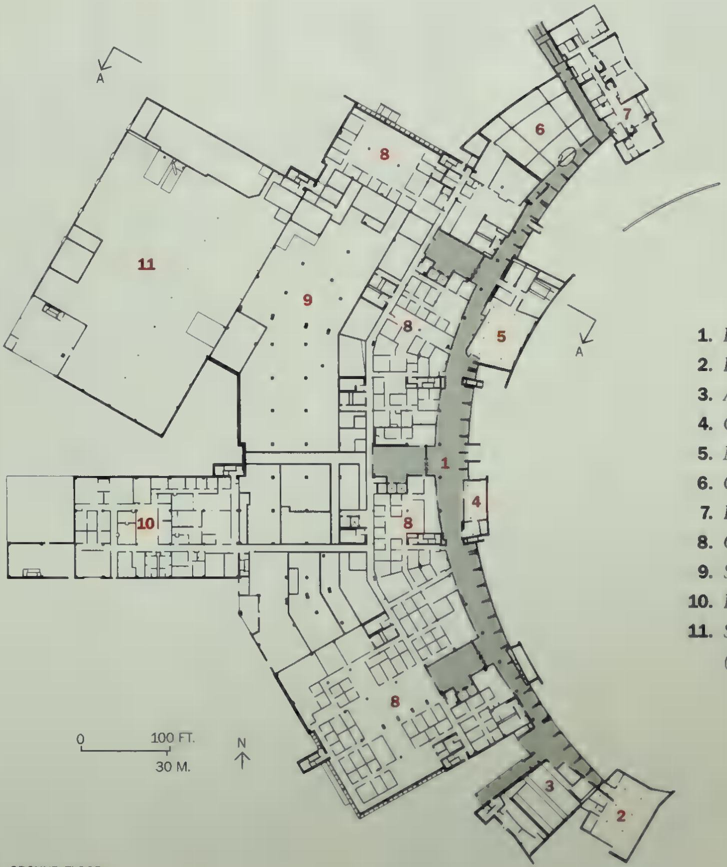


SECTION A-A

1. *Museum*
2. *Entry*
3. *Office*
4. *Storage*

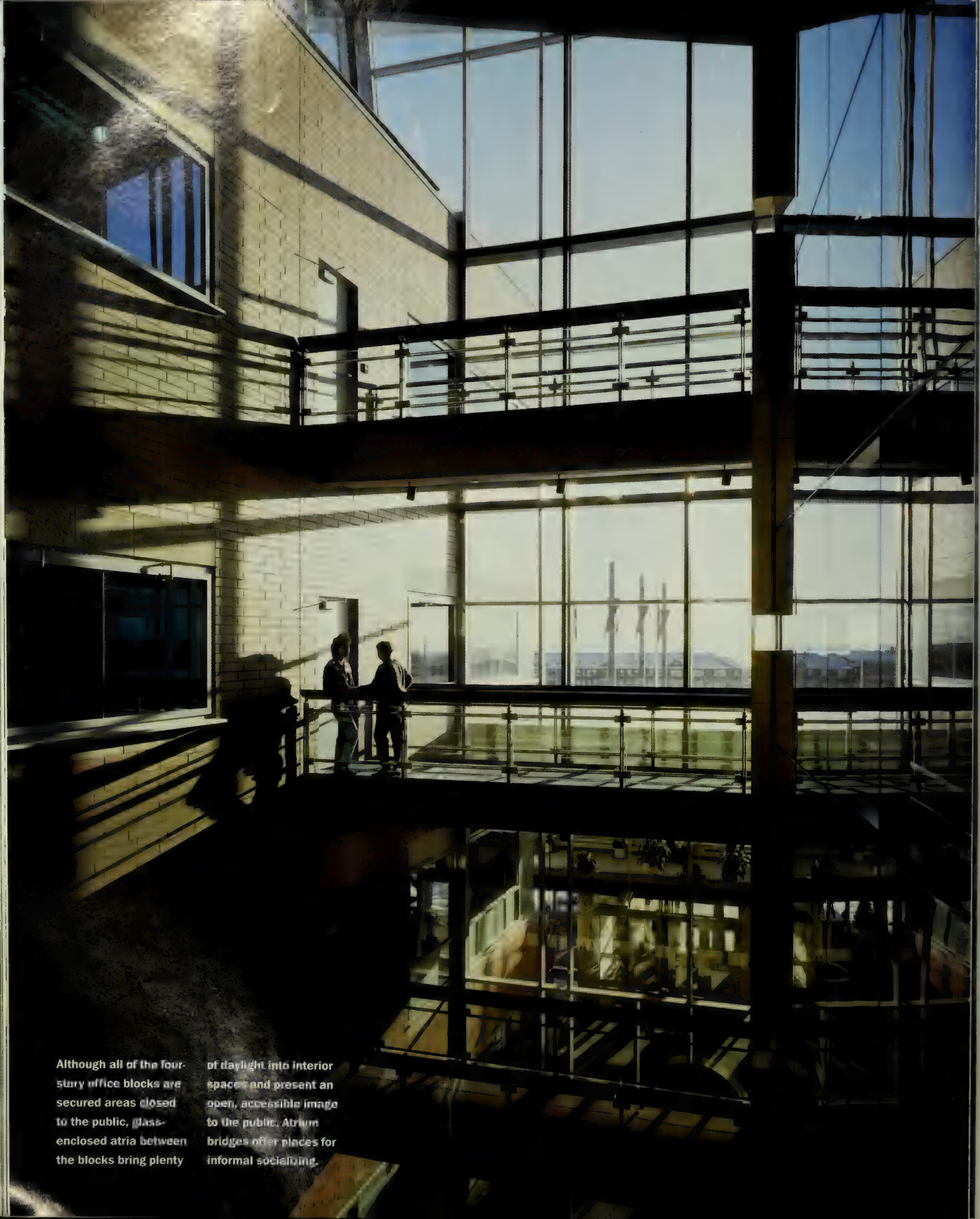


TYPICAL OFFICE FLOOR

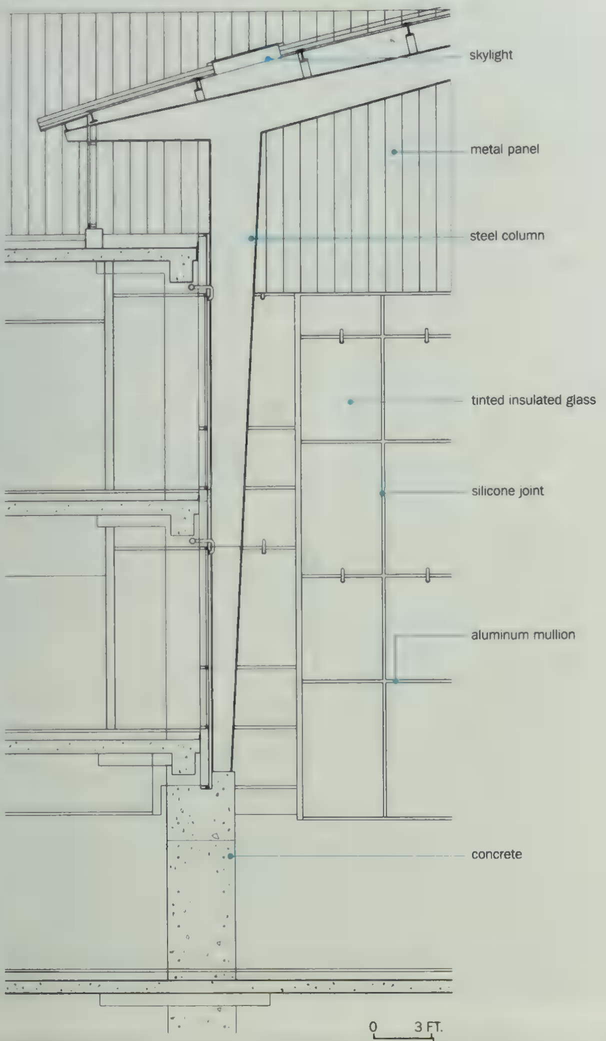


GROUND FLOOR

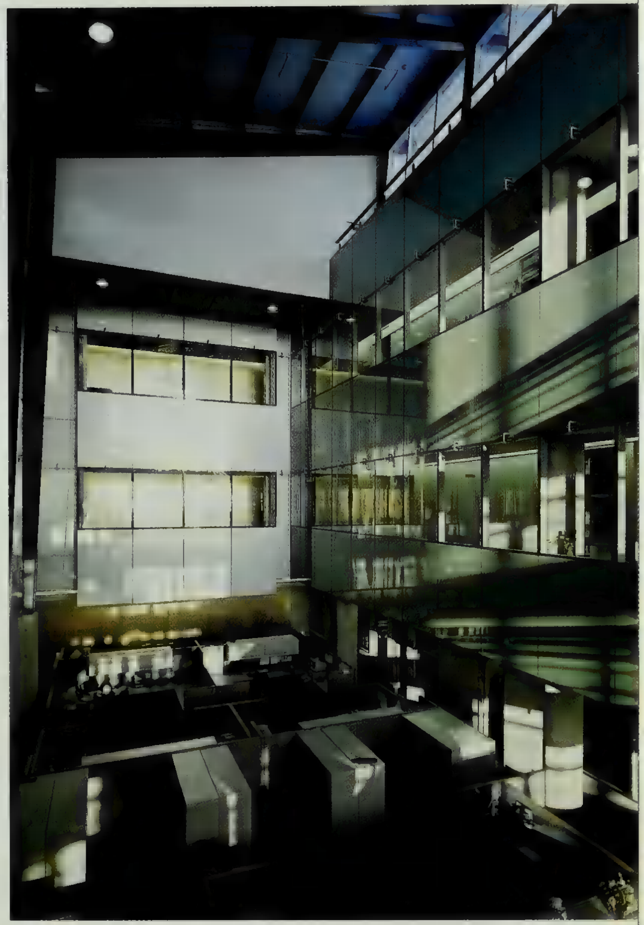
1. *Entry*
2. *Library*
3. *Auditorium*
4. *Gift shop*
5. *Museum*
6. *Cafeteria*
7. *Day care*
8. *Offices*
9. *Storage (floor below)*
10. *Laboratory*
11. *Service garage (floor below)*



Although all of the four-story office blocks are secured areas closed to the public, glass-enclosed atria between the blocks bring plenty of daylight into interior spaces and present an open, accessible image to the public. Atrium bridges offer places for informal socializing.



ATRIUM SECTION



**Public components in the headquarters complex—a library, auditorium, a museum, a gift shop, and a day care center—feed off the indoor "street" (far right). The public's first point of access is the main desk in the entry lobby (right). Workstations are set up in the atrium (above right).**

**A museum (above) engages the public with exhibits on the history of the Ontario Provincial Police and various aspects of police work. The building's cafeteria (right) and library (far right) are also open to visitors, as is a gift shop and an auditorium.**

One goal of the police headquarters was to include community-oriented facilities to bring the public into the building on a regular basis. The complex even has a day care center (below and right). Set at the north end of the project, the day care area has its own palette of colors and its own identity.

forensic and photography laboratories and a police-vehicle service garage. The natural slope of the site facilitates service access to this area, which is one floor below the level of the secure street.

The rest of the functions are located in remote buildings for canine training, storage, and emergency training (including a helipad).

**Fitting the building into the landscape**

The terrain in Orillia is typical of the transitional area where the Canadian "shield" begins to surface: hilly, forested, and with igneous rock outcroppings. Rather than build at the crest of the hill, the designers opted for the more modest solution of siting the building at mid-slope. The landscape plan offers a subtle gradation of plant life from mature trees on one end of the site to wetland plants on the other.

THE BUILDING STRATEGY WAS TO SURROUND A PUBLIC INNER CORE WITH A SECURE PERIPHERY.

A fountain in the project's ceremonial forecourt introduces water as an important design feature. Water then passes through a cascading crescent, finally draining into a series of picturesque retention ponds, which are surrounded by native species and accessed by way of a circuitous promenade.

Managing the OPP project was a major challenge because of its size and the fact that two firms worked together as a joint venture. But the simplicity of the diagram allowed for teams to be set up on specific elements, working within what Moxam calls "a clear set of architectural guidelines." And the joint venture was organized to enhance cooperation. Teams of people from both firms worked together from the beginning of design all the way through the completion of working drawings. This arrangement eliminated the usual division of roles played by design architect and local architect and provided "more satisfaction for the individuals working on the project," says Moxam.

With as many as 25 people working on the project at peak times, coordination was a major issue. "We met every Sunday morning to review everything," says Moxam. The result is a remarkable unity of language, in everything from the expressive structure right down to the carefully detailed benches that line the indoor street. The completed project belies the notion that the big building cannot have a human face. ■

**Sources**

**Curtain wall:** *LBL*

**Exterior aluminum panels:** *Rush, Novaspan*

**PVC roofing:** *Proxfex*

**Tinted, insulated bulletproof glass:** *AFG*

**Entry portals:** *Secur-able Tech*

**Security devices:** *Von Duprin*

**Acoustical ceilings:** *Armstrong, CGC*

**Paints and special coatings:** *PPG*

**Wall coverings:** *Crown, Metro*

**Plastic laminates:** *Formica, Wilsonart, Nevamar*

**Cabinetwork (museum):** *Exhibits International*

**Carpet tile:** *Interface*

**Wall finishes:** *Kurtz Mann*

**Linoleum flooring:** *DLW*

**Office furniture:** *Knoll*

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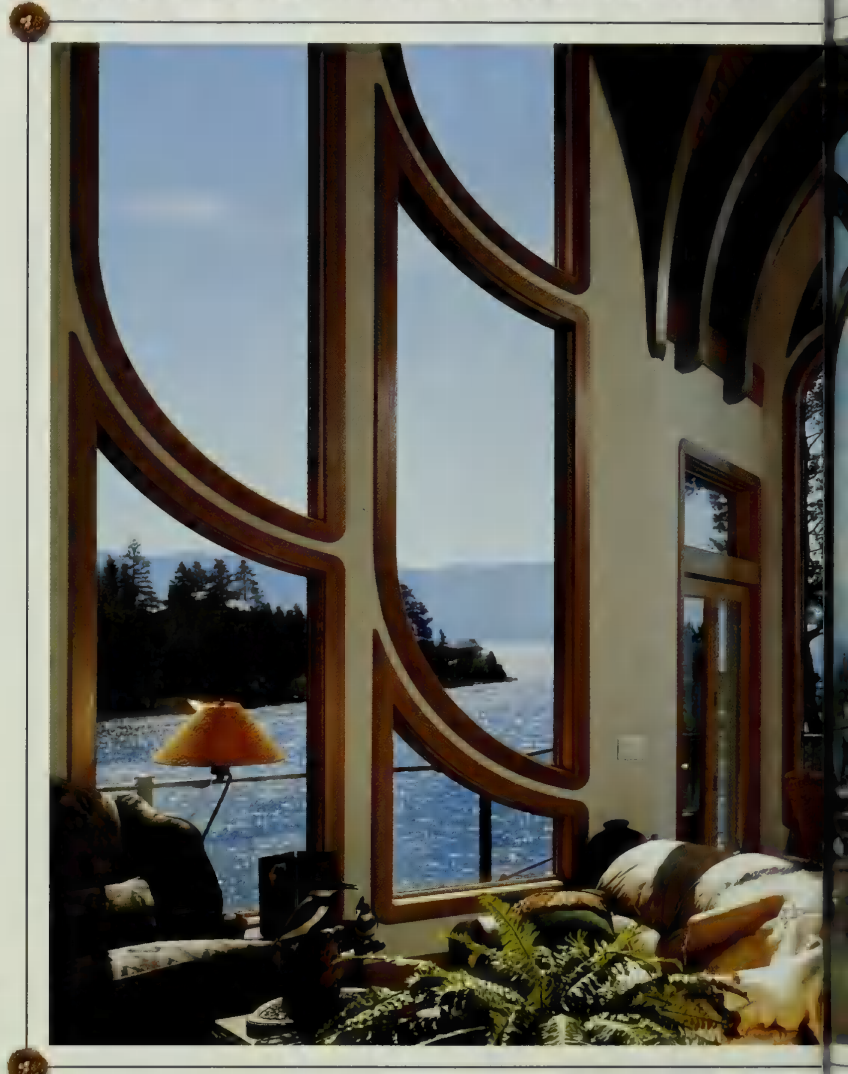
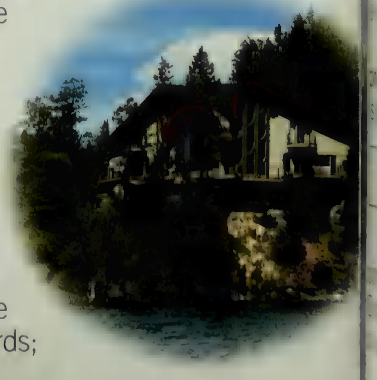
# AND TO THINK OTHER WINDOW MANUFACTURERS SAID IT



Architect Richard Smith grew up in Montana's Flathead River valley, exploring its forests, paddling its lakes and streams and marveling at the abundance and variety of its wildlife. So when he was asked to design a home perched above the waters of Flathead Lake, his inspiration was the majestic bird that makes its home in the same idyllic setting: the osprey.

Since the windows would be the key element in creating the look of a bird in flight, Richard spoke with all of the top manufacturers. More than one claimed they were impossible to build. Others were eliminated from consideration because their solutions compromised the design. Still others, because they couldn't provide the low maintenance finish the owner requested. Only one company rose to the challenge. Marvin Windows & Doors.



True to Richard's vision, yet mindful of builder Len Ford's timetable, Marvin's architectural department began designing the windows and creating the necessary production specifications. But a change in plans became necessary when the owner brought up his concerns about the frequent high winds coming off the lake. So Richard designed a special steel framework for the window openings and Marvin produced 24 direct glazed units with custom radii. Clad in the company's exclusive extruded aluminum, the windows conform to A.A.M.A. 605.2-92 standards;

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despite their unusual, non-standard configuration. Another 63 Marvin windows and doors in various shapes and sizes were also installed in this extraordinary home.

In the end, Richard Smith and Len Ford were as impressed with the process as they were with the product. And today, "the osprey house" is a required part of every boat tour of Flathead Lake.

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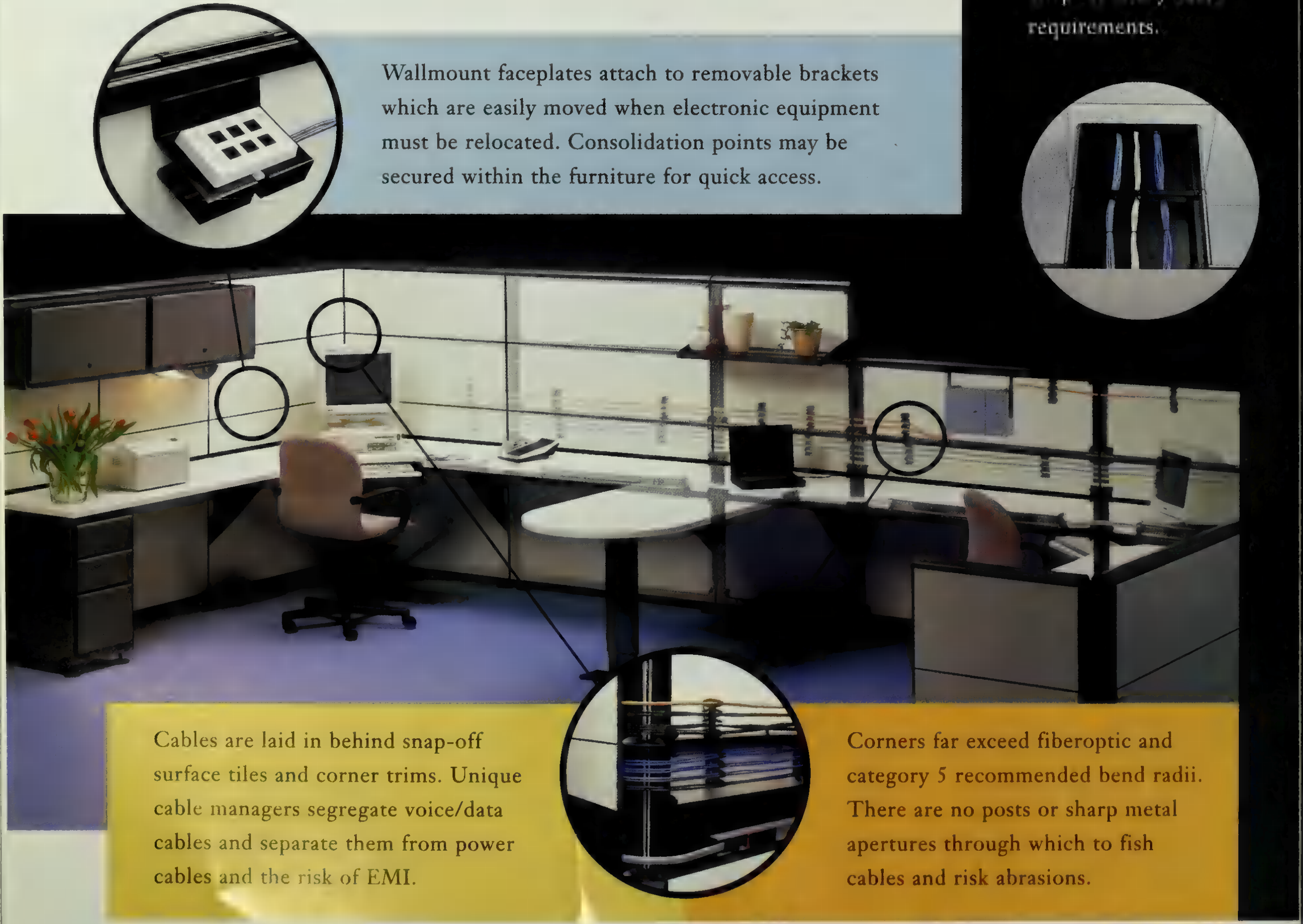

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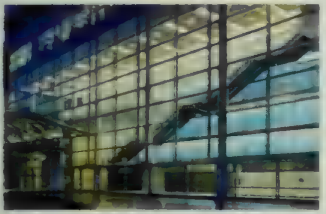
## ALTERNATIVE WORKPLACE

# The Way We Work

## EXPLORING AND UNDERSTANDING A CORPORATION'S BUSINESS AND CULTURAL GOALS IS THE FIRST PRIORITY IN DESIGNING A SUCCESSFUL ALTERNATIVE WORKPLACE.

**by James S. Russell, AIA**



1

**Stamford, Connecticut**

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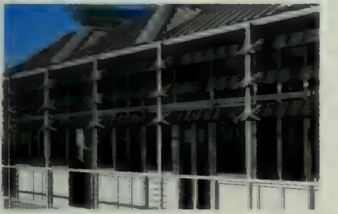


2

**Pittsburgh**

*The Robert L. Preger Intelligent Workplace, located in a new penthouse atop an academic hall at Carnegie Mellon, is an office environment research lab.*

3

**Mountain View, California**

*Silicon Graphics' new campus, designed by Studios Architecture, embodies the casual but fertile corporate culture of Silicon Valley.*

*The alternative workplace is much more than an office building with coffee bars and a health club. The projects presented in this study are the types of innovative work settings increasingly valued by clients. They represent flexibility in technology, and they inspire the creativity and social interaction that corporate America craves. However, the alternative workplace is not an endpoint but a constant evolution. Just when a given office is reconfigured, technology or business practices change again. Faced with these variables, the goal of the architect must be to create a building framework that supports ongoing change while continuing to embody corporate values.*

The alternative workplace is not very alternative anymore," says a gratified Franklin Becker, director of the International Workplace Studies program at Cornell University. For years, Becker, along with Michael Brill of BOSTI and Volker Hartkopf and Vivien Loftness of Carnegie Mellon's School of Architecture, were voices crying for change in the corporate wilderness. Workplaces designed to emphasize teamwork, technology, flexibility, and creativity were all ideas these people advocated. Now, at last, their cries have been heard and these ideas are moving into the mainstream. In fact, the four are now the leading advocates of a movement taken up by such prominent companies as MCI, AT&T, CIGNA, and the Discovery Channel, as well as many small but progressive firms. Each of these companies realizes that one-shot restructurings are not enough to stay competitive. Transformation is an ongoing process.

Executives, meanwhile, are trying to keep the corporate engine running while they are busy making repairs and, in some cases, tearing it apart. "You can reorganize every three years, but you can't make that reorganization operational so quickly," says Gene Rae, a historian, an anthropologist, and a partner at Studios Architecture who helps provide the firm with a better understanding of the human issues that businesses face. "The reorganizations don't have meaning for people, and you throw the organization into chaos. The company must be explicit about what its values are and how it can transcend reorganizations to make change occur more quickly and holistically."

And that is where architecture comes in. Design will highlight the cultural direction the company wants to follow. Cisco Systems, for example, used consistent facility design to unify and integrate the cultures of the 21 companies it has acquired in recent years. Creating constancy amid volatility should be a challenge and an opportunity for architects.

**THE CHANGING CONTEXT OF WORK**

| | PAST | PRESENT | FUTURE |
|---|---|---|---|
| WORK FOCUS | INDIVIDUAL | TEAMS | PROJECT DEPENDENT |
| WORKSPACE REFLECTS | STATUS | WORK PROCESS | OPTIONS FOR CHANGE |
| OFFICE REFLECTS | STRENGTH/IMAGE | CULTURE/IMAGE | VALUES/IMAGE |
| SPACE ALLOCATION | STATUS | FUNCTION AND STATUS | FUNCTION ONLY |
| BALANCING PRIVACY | SCHEDULED INTERACTION | SCHEDULED PRIVACY | CONTINUUM OF OPTIONS |
| RATE OF CHANGE | STATIC ORGANIZATION | CONTINUOUS CHANGE | CONTINUOUS CHANGE |
| MARKET FOCUS | STATIC/INWARD | GLOBALIZATION | BOUNDLESS |
| TECHNOLOGY | ANCILLARY | INTEGRAL | FULLY INTEGRATED |
| SOCIALIZATION | NEGATIVE VIEW | ENCOURAGED | VALUE ACHIEVED |
| WORK/LIFE | 9 to 5 | 8 to 8 | TIME/PLACE FLEXIBILITY |
| CAREER PATH | ONE CAREER, ONE COMPANY | EVOLVING CAREER, ONE COMPANY | MULTIPLE CAREERS, MULTIPLE COMPANIES |

*© 1998 Arthur Andersen, Peter Miscovich*

But compared to the functional-relationship diagrams and square-footage allocations that comprise the usual programming process, planning for change is abstract to architects and requires working and thinking in new ways.

When the process of planning for a new facility moves from counting heads to creating an environment for endeavors that may not yet be knowable, the architects involved may feel as if they've landed in the rhetorical muck of management gurus who talk of "human networks" in describing the kinds of creative social interactions companies need to foster. Understanding the need to create these networks, even when the circumstances seem a little "out there," is central to interpreting the needs of corporate customers. "Clients are looking at very strange things," says Christopher Budd, an associate at Studios. Budd is also not an architect, but a graduate of Becker's workplace study program at Cornell. "We see the concept of *feng shui* [an ancient Chinese method of creating harmony within a space] being used to bring meaning or spirituality into a space. Another client may hire choreographers. People are beginning to trust more intuitive ways of organizing their company."

**CORPORATIONS ARE BEGINNING TO TRUST MORE INTUITIVE WAYS OF ORGANIZING THEIR OFFICE SPACE TO HELP ENCOURAGE EXPERIMENTATION AND CREATIVITY.**

Companies are increasingly seeking environments that encourage experimentation. "Design studios and theaters are the kinds of metaphors companies are using to develop innovative capabilities," says John Kao, an author and consultant who specializes in business creativity.

Architects may inadvertently overlook the degree to which change drives, or should drive, a company to reexamine its most closely held values. In other words, where change is the only constant, corporate soul-searching moves to the top of the agenda. The stated corporate culture, expressed in "mission" or "vision" statements, may not accurately reflect the circumstances under which the business actually operates. So it is left to the architect to interpret those values and design accordingly.

Asking an architect to decipher a company's vision is a tall order. It means that architects must reassess their role in office-building design; they must now define the values to be expressed rather than simply laying out cubicles. They must design for patterns of human interaction rather than simply detailing exotic wood paneling for upper management. And they must now make a space that can, if needed, be easily rearranged, often within months of its completion.

### The fluid, low-cost workplace

If business cultures are murky and difficult to draw out, at least the broader trends in the way these change-driven businesses function are becoming clearer. "The one absolute is mobility," Becker says. But this can take lots of forms. Cubicles or offices may be augmented by a variety of meeting places, from formal conference rooms—which can be outfitted with full computer, electronic whiteboard, and videoconferencing capabilities—to a loose collection of tables, chairs, and partitions commandeered from the storage room.

Many businesses surround employees with amenities that are intended to lure them away from their desks and into settings where a casual remark or chance meeting may inspire "the next great idea." The gourmet cafeteria is no longer an oxymoron. For example, when the engineers at Fore Systems, in Warrendale, Pennsylvania, are forced to work long hours, their families may be mollified when the cafeteria chefs pack them a heat-and-eat meal. At many companies, the copy and fax area is placed next to a well-appointed coffee bar. Corridors widen into lounges. Fitness centers, company stores, handsome garden courtyards, and light-flooded stair lobbies and indoor atria are proliferating.

At the same time, company managers are working to drive down occupancy costs. The result: companies today build fewer private offices and fit them out more minimally. They have shrunk and reduced the number of cubicles, recognizing that many are occupied only a fraction of the workday anyway. For example, KMD Architects' Mark Miller, a project director for client Sun Microsystems, says Sun asked him to bring in a new campus for the company in Newark, California, at the same cost and with the same features and standards of design as the company's campus in nearby Menlo Park, California, which was completed two years ago. The problem is that the real estate market has gone up 12 to 15 percent since then. Keeping to the budget meant simplifying elevations, saving the expensive details for the most visible locations, and eliminating complicated curves and angles from the floor plan.

Consulting firms have been especially aggressive about reducing work areas devoted to individuals since consultants may spend up to 80 percent of their time in client offices or on the road. Back at the home office, they are assigned by a concierge to a carrel or cubicle fitted with phone and data-network connections, and perhaps a caddy containing stationery and supplies. A facility for management consultants Deloitte & Touche in Pittsburgh, recently completed by Burt Hill Kosar Rittelmann, involved designing an entire floor that takes advantage of previously unused faceted projections in the facade of Philip Johnson's mid-1980s neo-Gothic PPG Place. These "touchdown" areas—with desks or cubicles used by consultants checking in at the home office—are located in the highly traveled external corridors of the plan, which means that the consultants can more quickly pick up news and developments in the office from passersby.

A new Paris facility for Andersen Consulting, a management and consulting firm, designed by architect Jean Michel Willmotts, takes the concept of accommodating the management consultant who veritably lives on the road one step farther. After being greeted by the concierge, the consultant is issued an electronically coded card. A card reader recognizes the consultant and displays on a screen a map that shows the consultant the route to his or her temporary workplace and to other resources: a quiet library, the work group to which the consultant is assigned, a meeting room set up for teleconferencing, and so on. Andersen expects to triple its business in Europe within the next 10 years but cannot afford to triple its space. Using whatever desks are available minimizes the number of empty office areas and reduces space needs to about 50 square feet per person, compared to the conventional American office, which budgets about 250 square feet per person.

A few years ago, Gaetano Pesce designed a floor for Chiat/Day advertising in New York City that provided fixed work spaces only for those bound to their desks by technology needs, such as art directors, who need powerful computers and large-format screens (RECORD, September 1994, page 92). The rest of the staff works collaboratively in "project rooms," teamwork spaces dedicated to particular clients or products. Or they can take a laptop and a portable phone to a variety of settings to work individually. This "nonterritorial" environment was greeted with suspicion at the time, but it has continued to work for the firm (now TBWA Chiat/Day). In the meantime, many of the innovations have been assimilated by other agencies.

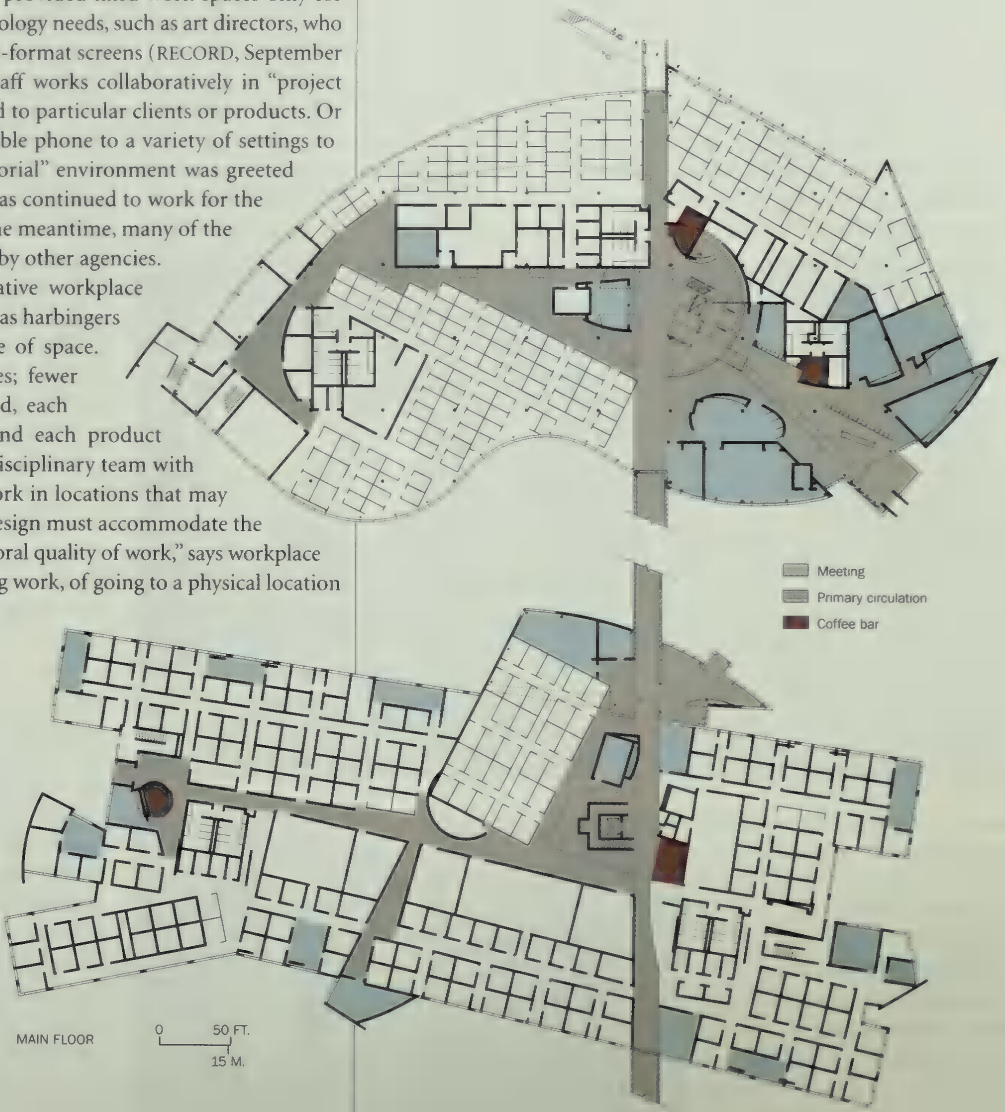
Becker and other alternative workplace proponents see such environments as harbingers of even greater fluidity in the use of space. Fewer employees have fixed duties; fewer companies have fixed jobs. Instead, each new project, each new service, and each product innovation is handled by an interdisciplinary team with members that change, and who work in locations that may shift, depending on the project. "Design must accommodate the increasingly project-oriented, temporal quality of work," says workplace consultant Kao. "The idea of lifelong work, of going to a physical location and doing one thing, is gone."

### Working apart, working together

The trend to work at home appears to be growing rapidly, though most people are there only part time and some still maintain an office in a corporate setting. According to a Louis Harris poll released this spring, 19 percent of those who responded work at least a few hours per week at home. As this trend began to take hold in the early 1990s, experts predicted the end of the formal office, since everyone would be on-line in virtual work spaces.

But many businesses have discovered that just the opposite is true, that the speed of business change today requires more people to work together more intensely. Hence the increasing number of teaming environments at the workplace, and the increased thought given to the nature of social interaction—the coffee bars, breakout spaces, and fitness areas. Some corporations now want to keep people in the office. As a result, clients are more receptive to amenities the architects may work into the design.

Architecture that conveys egalitarianism creates an environment



**The layout of Fore Systems, a computer networking business in Warrendale, Pennsylvania, has ample formal and informal meeting areas. Designed by Studios Architecture, the space reflects the current shift toward understanding workplaces as networks of human interaction.**

that's more comfortable for everyone, and keeps employees feeling like they're part of the team. On the interior, the predominant features of such environments include high-ceilinged, loftlike floors, where daylight and views are accessible to everyone, regardless of rank (see Silicon Graphics, page 154). Expressive exterior architecture is increasingly used to connote an innovative, creative image. Such distinctive work environments are helpful in attracting and retaining valued staff in today's skills-short economy.

**THERE CAN'T BE A RICH CULTURE OF INFORMATION AND KNOWLEDGE EXCHANGE IF INDIVIDUALS ARE ISOLATED IN HOME OR "VIRTUAL" OFFICES.**

Finance may seem to be the most placeless of businesses. After all, detailed financial information is available just about anytime to almost anyone with a computer, a modem, and a certain amount of technological savvy. But those who work in most facets of the finance business recognize that being a virtual employee is not enough; it's better, for example, to group brokers desk to desk and monitor to monitor in a single room so they can read each other's visual cues.

"Trading is a group effort, not just people looking at a screen or working by themselves," says Markus Buergler, executive director of corporate real estate for the Swiss Bank Corporation, whose new trading floor in Stamford, Connecticut, is one of the largest in the world (page 142). He describes how traders function under an intricate hierarchy akin to that of a conductor and an orchestra. Senior traders, or "market makers," use voice and gestures to guide the work of trading subgroups and junior traders. A sudden spike in activity across the room cues the trader to important breaking news in another market segment. The trader can react before the news hits CNN, Bloomberg, or other news services. The few moments gained by the traders being able to see each other offers them a key competitive edge, according to Buergler.

The renewed appreciation for human contact and proximity is extending beyond the business world to encompass cities and metropolitan regions. "You can't have a culture of information and knowledge exchange if individuals are isolated," says Frank Duffy of DEGW, a London-based architectural firm that provides strategic planning and assistance in the development of workplaces that support change. That's why places where certain types of businesses are concentrated are so prosperous: they are "places where people meet, marketplaces for talent." Duffy sees the rediscovery of the fundamentally social nature of work as reinvigorating for cities. "You can see the office turning into a kind of club, and people walking around the city [or the metropolitan area] and encountering each other in very rich social ways."

New York City, for instance, may be slow in adopting more fluid office layouts, but the city itself provides a diversity of settings; business is conducted on street corners, in restaurants, in "corporate challenge" footraces, at theater outings, museum openings, and charity events. The same may be said of Silicon Valley, where a shared culture and emphasis on technology provide fertile ground for new ideas.

**At Deloitte and Touche, conference spaces may be formal or casual (above). Consultants who spend most of their time on the road are issued carrels (right) equipped with office supplies.**

### Designing for the unknowable

"Change is not a three-to-five-month project," Becker says. "Most companies try to do it in three to five years. Even so, they don't find it easy." A common scenario in the process of actualizing the alternative workplace goes like this: The company first decides to put all low-level staff in the same standardized cubicles—essentially because they perceive that the design of the space "doesn't really matter." Private offices are still used to confer status or job level. Then the company decides that everyone should go into the same universal cubicles. But then they find that standard shoulder-high cubicles "do nothing well," as Studios' Christopher Budd says. It is only at this point that management begins to differentiate space, laying it out based on job function rather than status.

When a business reaches this crucial juncture, the company may question whether architecture can support its new work struc-

**Information technology** is upending conventional workplace planning notions. Technological gadgets—including computers, printers, faxes, and even telephones—that once tied workers to their desks and offices have become increasingly portable. The long-anticipated paperless office is closer to becoming a reality as work is stored on data networks and transferred, via E-mail, to remote workers, while low-priced scanners and software that recognizes and digitizes text and images are more widely available.

In fact, technology may someday move us from paperless offices to deskless offices. Right now there are plans to commercialize a palm-sized computer that will be worn on the user's belt. The tiny computer will react to voice commands delivered through a headset and display information on a small screen suspended in front of the user's eyes.

Consider the possibilities just within an architecture office. The wearer could record site conditions using voice and video, return to the office and meet directly with the project team and consultants, then move on to the library to work out design details or specifications—all without having to sit at a desk, typing up notes and checking files. A project may have a space and a task may have a space, but the individual no longer does. The consequences of such a workspace, of one that is oriented around networks of use instead of employees, are just beginning to be understood.

Videoconferencing setups are costly and require customized conferencing rooms. But this technology, too, is becoming less expensive and more portable. Soon, a project team will be able to set up a meeting on short notice without specialized facilities. The conference could be viewed on any computer screen with a camera attached to it.

Wireless networks already permit greater fluidity in staff location, though these are limited in data capacity and may actually entail more wiring than conventional networks. But wireless phones are currently used in offices, and a wireless network might allow someone at a meeting to call up a spreadsheet residing on a network from a laptop without plugging in.

Only a few years ago, the idea of universal cabling took hold, with the result that each change in technology could be accommodated without having to rip out old cables and replacing them with new ones. Data cabling needs are still rapidly evolving, which means that making cables readily accessible is more important than ever (see The Robert L. Preger Intelligent Workplace, page 148).

Raised-access floors offer flexibililty and allow offices to be rearranged within a 10- to 12-foot radius with no recabling. Exposed overhead cable trays are popular in software-engineering environments because they are accessible to the engineers themselves, who would otherwise jury-rig all kinds of provisional cabling. They are also inexpensive, compared to raised floors. But they are considered unattractive and are rarely used.

Carnegie Mellon University is involved with researchers who are trying to digitize voice and video so they can be scanned, searched, sorted, and displayed on screen, just as text is. As a result, workers will, for example, be able to search network news archives for keywords to find visual information. They will also be able to translate voice messages so they can be read on the computer screen, or translate E-mails and faxes into audio messages so they can be heard over the phone from an airport or a hotel. Says Anthony Nuciforo, a principal at Robert Derector Associates, a telecommunications consultant in New York City: "It's just another way to keep people from becoming tied to their desk." *J.S.R.*

tures and whether architects have the skills to realize and implement the ambitions that the company itself may not be able to fully articulate. Meanwhile, the burgeoning field of workplace change management is redrawing the boundaries of conventional practice for many professionals, not just architects. Large interior design practices now promote "alternative workplace" strategizing, moving into territory formerly occupied by management consultancies, who, in turn, see office design as an increasingly important aspect of what they do.

Clearly architects must be ready to differentiate themselves from other professionals. The first step is to recognize that conventional programming processes usually prove inadequate. Instead, those who have managed workplace reorganizations say it's essential to "drive the dialogue deeper," or learn the real attitudes and behaviors of the company and its workforce. This may require extensive interviewing. Focus groups can be useful as well. During the process, it's important to remember that space should be designed to suit attitudes, behaviors, and processes, rather than job descriptions. "There is so much ambiguity creeping in," Kao says. "An architect must be alert to differing agendas."

Another effective tactic in reorganizing the workplace is to talk to the right people, those in the company who are leading change. Facilities managers, fearful of losing control, may not be fully committed to a less rigid workplace strategy. Peter Miscovich, director of the Workplace Transformation Practice at Arthur Andersen in New York City, says his company is beginning to train managers to be agents for internal change. These nascent "change-management departments" can go a long way toward helping employees and, therefore, architects, to understand a company's goals.

Conversely, leadership-driven change may underestimate the role of such departments as human resources or information technology, even though the success of the reorganization may hinge on them. "Everyone talks about promoting collaboration, but we see very few companies that do training at any higher level than word-processing skills," says Budd. An architect can build credibility by making sure that these key departments are involved.

Architects need to be aware that companies expect to lower real estate costs as part of the restructuring process. Most firms develop targets for cost or personnel ratios per square foot early in the process. As the design concept or work methodology becomes more explicit, the architect can test the owner's early assumptions. Aggressive cost targets can sometimes be met by giving individual business units more freedom to determine how they use their allotted space.

Clients who are fundamentally reevaluating themselves and the way they use facilities expect architects to do more handholding and invest more "face" time. But the design of the physical space may be the means by which companies express their identity and carry the company forward through generations of wrenching change. Indeed, simply making workplace ideas physical, via quick, inexpensive prototypes, often reveals much to clients about how realistic or appropriate their intentions are. It is also the best way for architects to experiment with innovative business models. ■

1

# Swiss Bank Center Stamford, Connecticut

## TO MAKE 800 TRADERS COMFORTABLE IN ONE GIANT ROOM, THE ARCHITECTS PAID CAREFUL ATTENTION TO ACOUSTICS AND TECHNOLOGY.

**by Virginia Kent Dorris**

**Project:** *Swiss Bank Center, Stamford, Connecticut*

**Owner:** *SBC Warburg Dillon Read*

**Architect:** *Skidmore, Owings & Merrill LLP—John H. Winkler, FAIA, administrative partner; David M. Childs, FAIA, Mustafa K. Abadan, FAIA, design partners; Marilyn J. Taylor, AIA, urban design partner; Stephen A. Apking, AIA, interior design partner; Gert D. Thorn, AIA, project director; Stephen Weinryb, AIA, senior technical coordinator; Kenneth A. Lewis, senior designer; Lois A. Mazzitelli, senior urban designer; Randy Fahey, senior interior designer*

**Engineers:** *Cosentini Associates (lighting, MEP); Thornton-Tomasetti (structural); Allan Davis Associates (civil, traffic); Langan Engineering and Environmental Services (geotechnical); Cerami & Associates (acoustical, A/V)*

**Consultants:** *Hines Interests Limited Partnership (development); Van Deusen & Associates (elevator); Schiff & Associates (security); Poulin & Morris (graphics); Walsh-Lowe & Associates (information technology); Cini Little International (kitchen); Weintraub + di Domenico (landscaping); Metcalf & Eddy (technologies, environmental)*

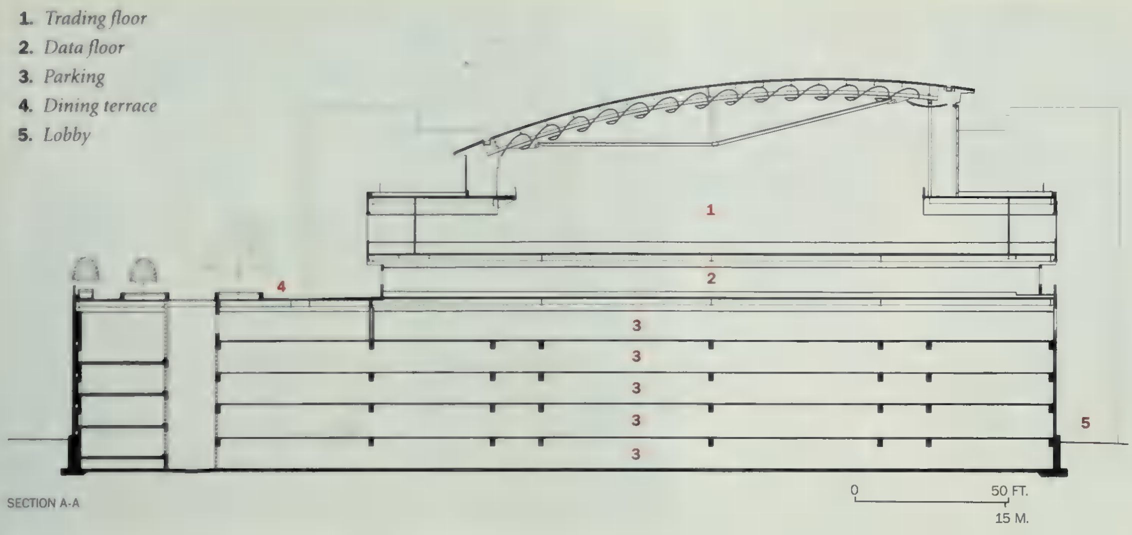
**General Contractor, Construction Manager:** *Turner Construction Company—Robert E. Fee, construction manager; Richard C. Bach, project executive*

Working as a trader for a major bank must be one of the most anxiety-producing jobs in the world. With eyes glued to multiple computer screens and ears pressed to telephone receivers, all the while watching for signals from other traders, these merchants of stress can make and lose millions of dollars instantly as the world's financial markets fluctuate. A moment's hesitation can mean big losses. It's little wonder, then, that SBC Warburg Dillon Read, a division of the Swiss Bank Corporation, sought to make the trading floor at its new Stamford, Connecticut, complex as convenient and efficient as possible.

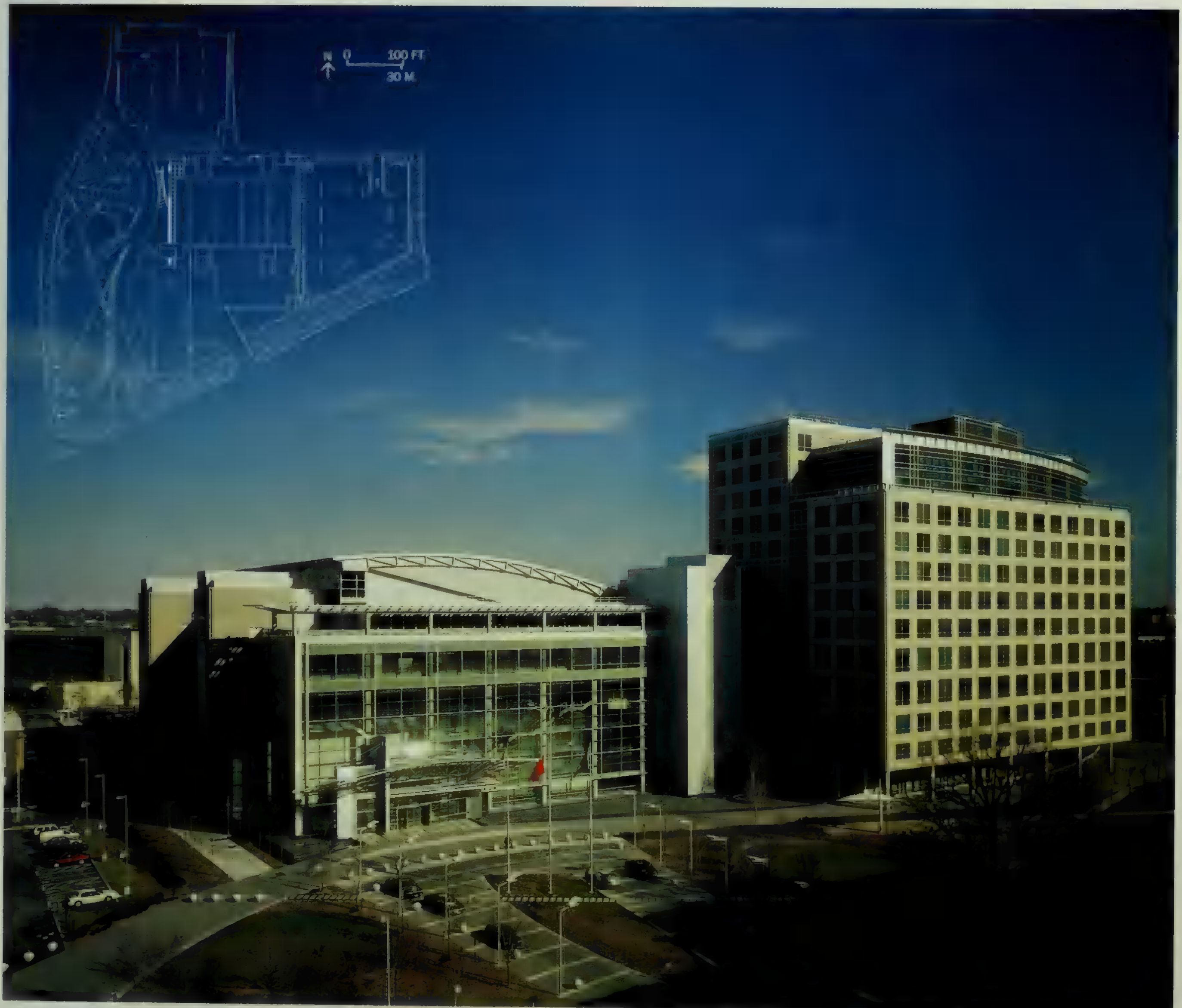
The trading floor is at the physical and operational center of the Swiss Bank Center, designed by Skidmore, Owings & Merrill's New York City office. The first phase of the project, completed last fall, is 861,000 square feet. It includes the trading floor—located atop five floors of parking and a data floor—and a 13-story office building with a street-level steak house. SOM is now developing phase two of the plan, which will extend the trading floor 120 feet to the east and include a second office tower. A third tower, located to the north of the trading floor building, is included in the final phase of the master plan, making the center a total of 1.4 million square feet.

*Virginia Kent Dorris is a freelance writer specializing in architecture. She lives in Brooklyn, New York.*

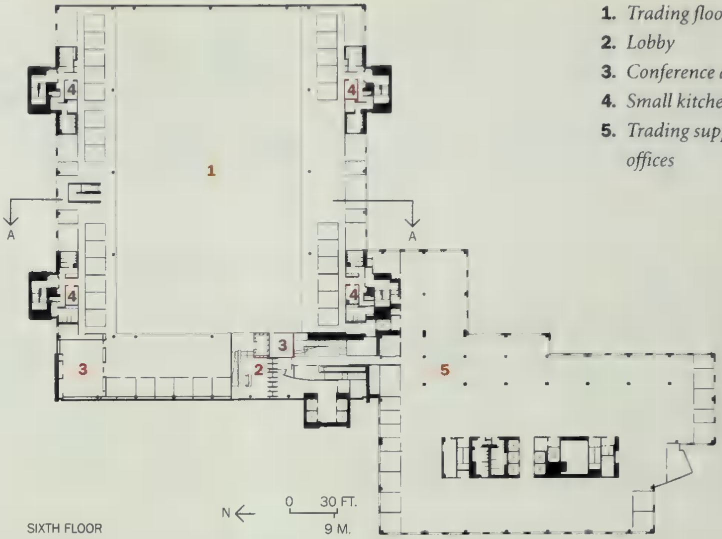
Creating a single space large enough to accommodate 600 to 800 traders was the bank's top priority, says Markus Buergler, executive director of corporate real estate for SBC. The new 50,000-square-foot trading floor, with its clear span of 210 feet by 132 feet, is among the world's largest column-free trading spaces. The room permits unimpeded and constant opportunities for spoken and visual communication between the traders, providing them with a previously unavailable awareness of each other. "Trading is a complex, team effort," explains Buergler. "The different trading



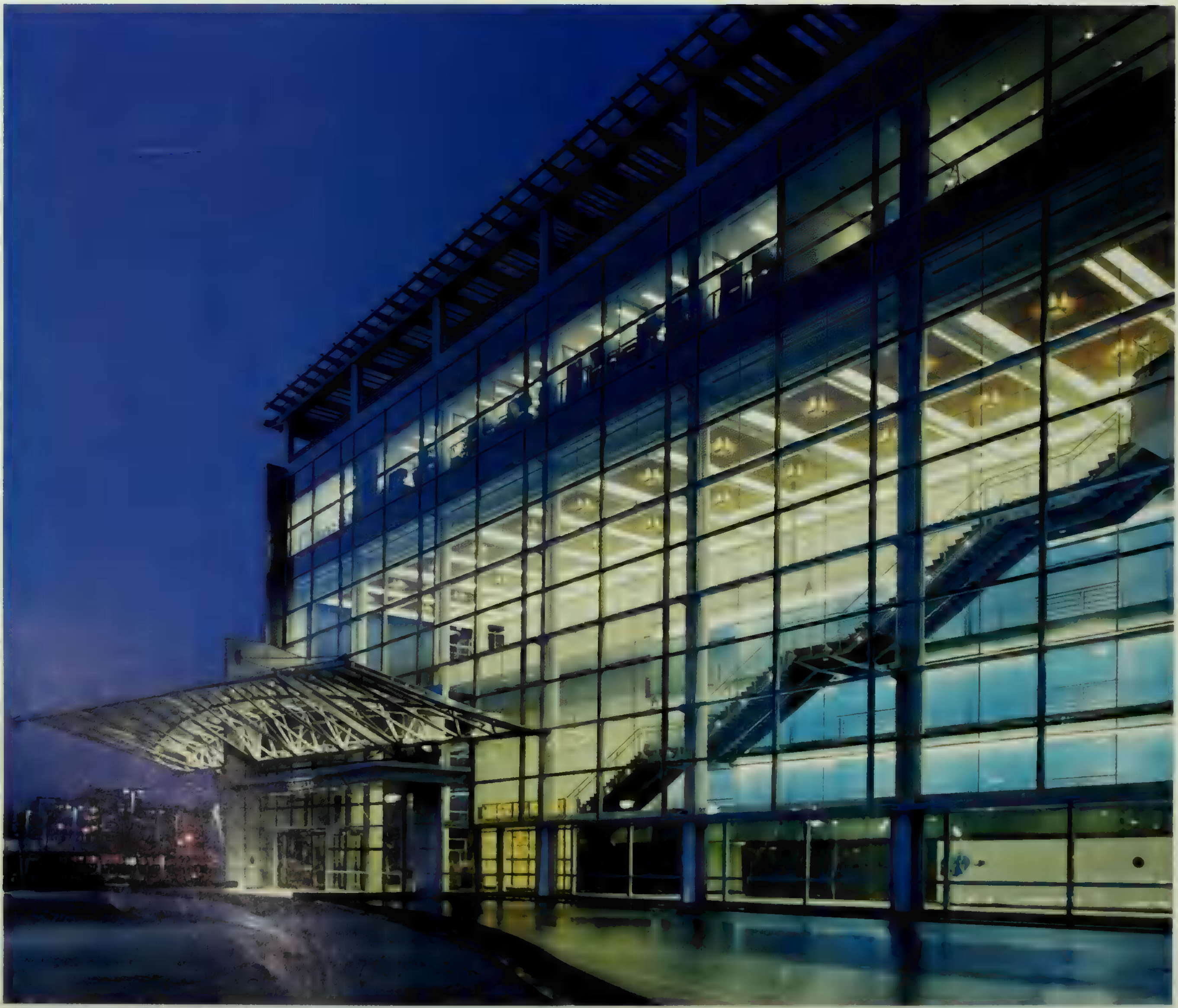
**The Swiss Bank Center is located near Interstate 95, a commuter rail station, and the Long Island Sound (opposite top). The first phase of development is complete (left and below). Two more office towers and an addition to the trading floor are planned.**



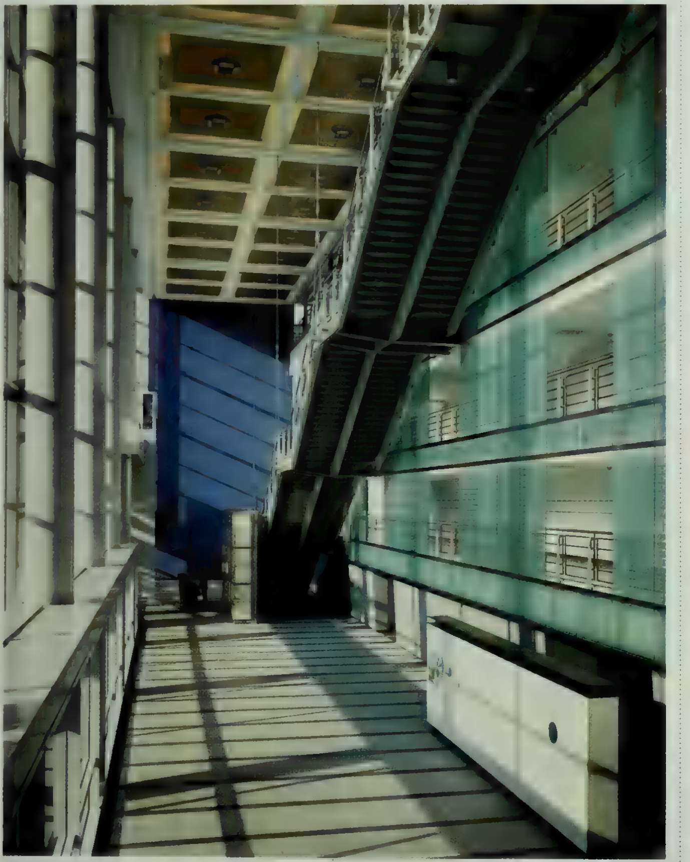
**The elegant five-story, glassed-in lobby (below) proclaims to passersby that this is the site of a major financial institution. In fact, once a pending merger is complete, SBC will become the second-largest financial institution in the world.**



1. *Trading floor*
2. *Lobby*
3. *Conference area*
4. *Small kitchens*
5. *Trading support offices*



The lobby walls (left) hide a parking garage. The stairway in the lobby (below) appears to be suspended from steel cables, but it is cantilevered off the adjacent wall. A conference area atop the office tower (right) offers a view of Long Island Sound.



groups don't function independently. You need to bring them together so they can interact in an ideal way."

In 1993, faced with a need for more room and a desire to upgrade financial services technology, the New York City–based bank hired SOM to analyze alternative locations. At the time, the bank was in a period of growth. Finding a site with plenty of room for expansion was important.

From an early list of 30 sites, most in existing office towers, the bank narrowed the list to six possibilities, four of them in Manhattan. SOM's analysis showed that it would be difficult to create a trading floor of the ambitious proportions wanted by the bank in an office tower. Upgrading power and communications technologies also seemed more difficult in a tower.

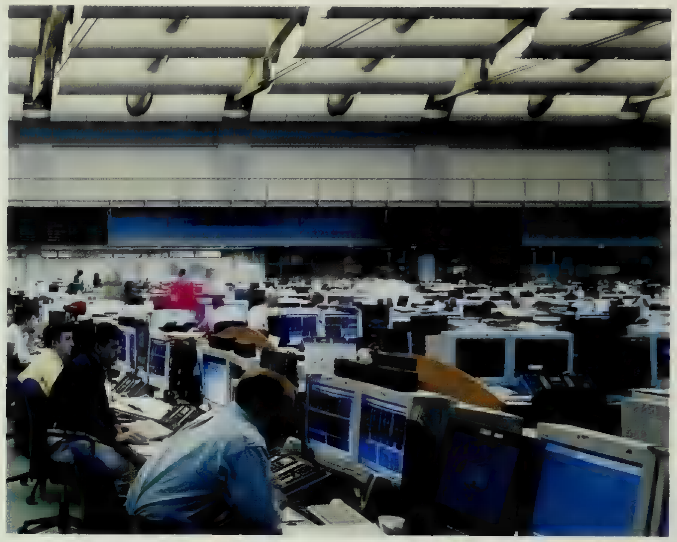
Influenced by generous tax incentives from the State of Connecticut and logistical help from Stamford's Urban Redevelopment Commission, the bank eventually chose the 12-acre Stamford site. About 15 percent of the 2,200 workers commute to Stamford from New York City. "Today, we trade with phones and computers. We are not so dependent on location as in the past. The move out of Manhattan's financial center was not a major hurdle," explains Buergler. The strong technical underpinnings of the facility have allowed the traders access to computer-based financial technology not available in their previous Manhattan location.

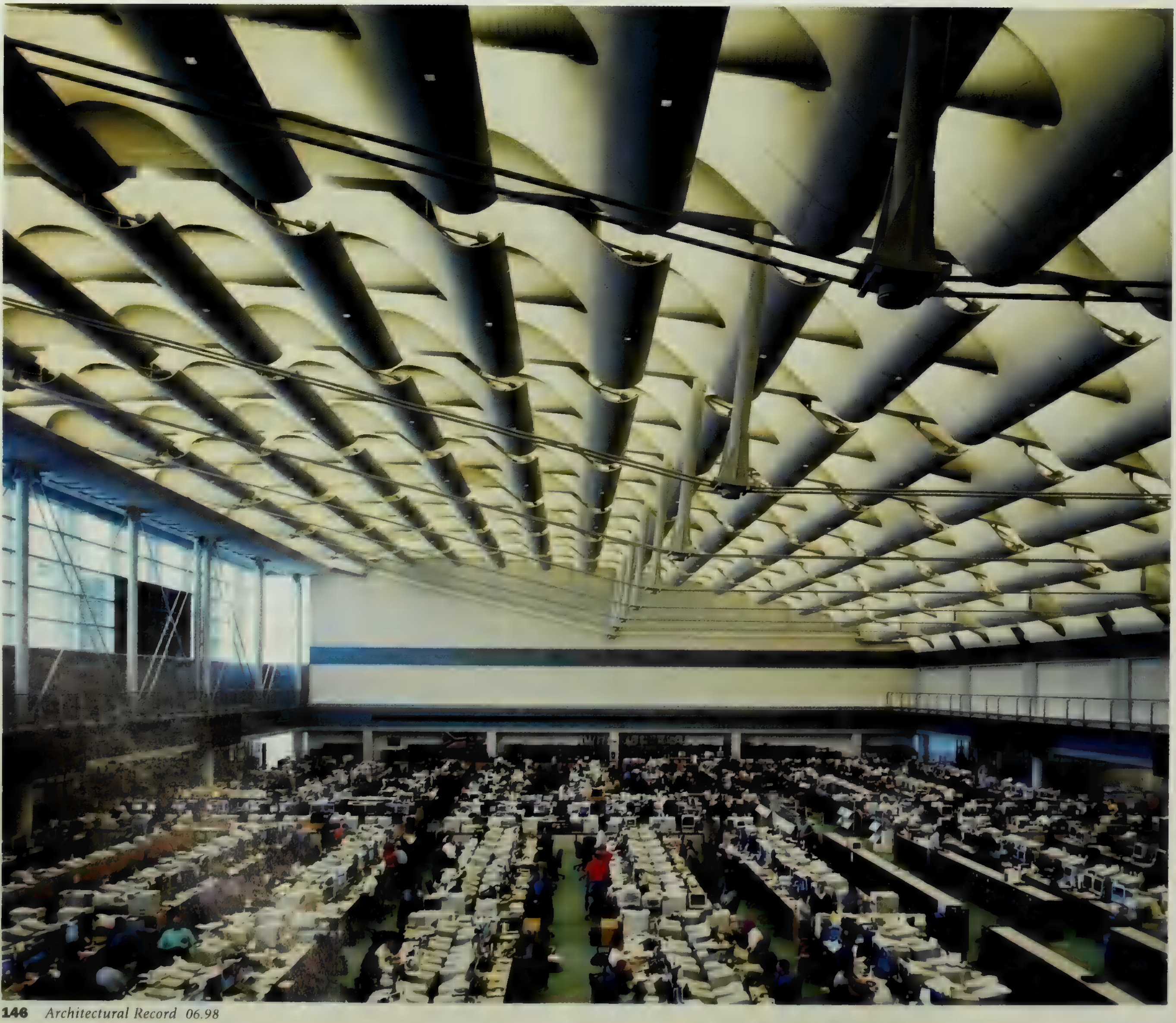
From the start, the plan was to create an atmosphere that encouraged interaction between the bank and the surrounding community. A broad walkway in front of the building invites pedestrians to cross the site, even if they are simply walking from the commuter rail station across the street into downtown Stamford. The bank also created a three-acre public park along the western edge of the site. Trees all around help to hide views of Interstate 95, which borders the site. The park is traversed by narrow paths that bring to mind the paths made by college students walking across campus greens. When completed this year, the park will contain numerous sitting areas, a café, and a 50-foot-tall stained-glass cone by British artist Brian Clarke.

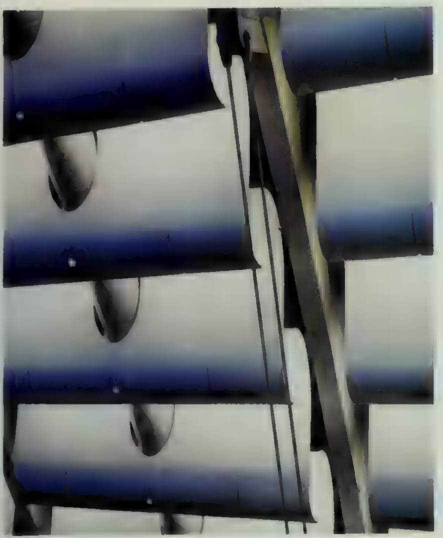
During Stamford's "urban renewal" days of the '60s and '70s, office towers were perched atop multistory parking garages, leaving the human portion of the buildings disconnected from the street. SOM didn't want to repeat the mistakes of the past. "We didn't want another freestanding parking garage next to an office building," says Ken Lewis, SOM's senior design associate on the project. However, they were required to include above-grade parking within the complex. Their solution was to disguise the garage by placing it within the main mass of the vaulted structure, where the trading floor is located. This treatment, combined with the airy, accessible street-level lobby, makes the parking invisible to the passerby.

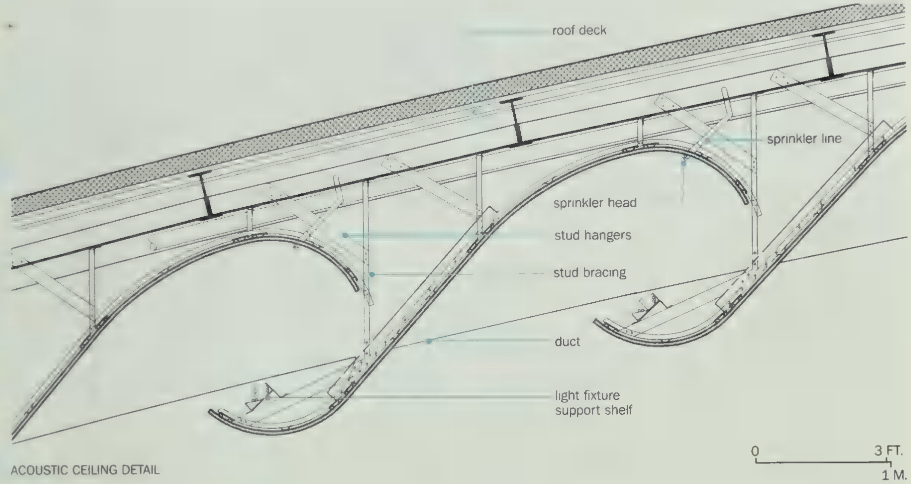
Swiss Bank was not looking for a "trophy" building for the Stamford site, says Mustafa K. Abadan, FAIA, SOM's project design partner. But the building's grand, five-story, glass-enclosed lobby makes it clear that this office complex is home to one of the world's major financial powerhouses. At the back of the atrium, a sculptural steel staircase, cantilevered from the walls of the

SOM has designed numerous trading floors, but never one of the magnitude required by SBC (below). Among the issues SOM faced was finding a way to create the column-free space and supply as many as 800 traders with vital power and data links (right). The solution was a four-foot-deep plenum beneath the floor for wiring and cabling, with extra space to fulfill future needs. The plenum is easily accessible, and wiring can be reconfigured as desks are rearranged and traders are relocated. The wavelike acoustical ceiling panels are pierced by conditioned air and power conduits (opposite top). Overhead light fixtures are directed toward the panels, creating soft, glare-free light below. Conference rooms overlook the trading floor (opposite bottom).









ACOUSTIC CEILING DETAIL

adjacent parking garage, appears to be suspended from the ceiling on steel cables. Behind the staircase, fritted glass panels edge a balcony that takes employees from the parking garage into the building. The mostly glass exterior maximizes views of the park. The back wall of the atrium is washed in blue light, SBC's corporate color, by neon fixtures located in ceiling coves.

Flexibility was a priority throughout the complex. The bank expects to move every employee at least once a year, so SOM laid out the office building on a five-foot module and specified interior partitions that could be moved overnight to create new offices. "We have had constant changes in groups and in adjacencies, so we wanted to be able to tailor the space to meet business needs," explains Buergler. Lighting, ventilation, and even fire-protection systems are installed in ceilings and floors so they do not have to be adjusted when the office layouts change.

Openness is stressed throughout. In the office tower, most employees are in offices separated only by low partitions. Glass walls enclose perimeter offices. The row of offices surrounding the trading floor, most of them used by head traders who also have desks on the floor, have glass fronts permitting views of the action beyond.

SOM also designed the trading floor with maximum flexibility in mind. A four-foot-deep, easy-to-access plenum contains cables that supply power, communications, and financial data to the desks of the traders. There's even room to spare for future technologies. SOM also designed the room to be easily reconfigured, if needed. An arena-style raked floor could be installed, using part of the space below the current floor, without disrupting the building's technical systems.

The complex takes electric power from two separate sources that travel through the building along two separate paths. If one power source is disrupted, a second supply is already available. In the unlikely event that both supplies are disrupted, there's a generator that can supply 100 percent of the building's power needs for a week. Uninterrupted power is essential for the complex's data center, one level below the trading floor, where the massive computer storage and monitoring systems are located. Power is supplied to the trading floor from electrical hatches in the floor, connected with flexible cable so they can be easily moved.

Uniform, indirect light is provided by north-facing clerestory windows and fluorescent overhead fixtures that bounce light off billowy acoustical panels. Inspired by the center's proximity to Long Island Sound, the wavelike panels, made

of fiberglass-coated insulation, are suspended from the 35-foot-high ceiling. The panels help to evenly distribute cool air supplied from exposed ducts located near the ceiling. The panels also help mitigate the noise level in the frenetic trading space below.

Nine 144-foot-long king-post trusses support the vaulted roof. Each truss consists of a curved steel box girder top member that is attached by a pair of steel cables to the bottom member, a cylindrical steel tube. During erection, contractors jacked the tension in the cables to 150,000 pounds to create the necessary support for the roof.

The room is flanked by four small kitchens, each with vending machines that make coffee and snacks convenient and constantly available to the busy traders. There is also a 375-seat cafeteria in the office building that has an open terrace with an additional 140 seats for dining. The terrace is high enough to afford a view of the calm, blue sound. ■

**Sources**

**Stone curtain wall:** *Metro Panel Systems Inc.*

**Metal and glass curtain wall:** *Lessard, Beaucage, Lemieux, Inc.*

**Precast concrete panels:** *Saramac Inc.*

**Elastomeric roof:** *Hypalon*

**Standing-seam metal roof:** *Innovative Metals Corporation*

**Glazing:** *Viracon*

# 2

# Robert L. Preger Intelligent Workplace Pittsburgh

## A NEW WORKPLACE LABORATORY FOR ARCHITECTURE STUDENTS SITS IN A PENTHOUSE ATOP A 91-YEAR-OLD ACADEMIC BUILDING.

**by Mildred Schmertz, FAIA**

**Project:** *Robert L. Preger Intelligent Workplace, Pittsburgh*
**Client:** *Carnegie Mellon University; Center for Building Performance and Diagnostics*
**Architect:** *Pierre Zoelly, AIA; Center for Building Performance and Diagnostics, project research, development, and conceptual design; Bohlin Cywinski Jackson—Peter Q. Bohlin, FAIA, design partner; Jon C. Jackson, AIA, partner in charge; Gregory R. Mottola, AIA, project manager; Robert S. Pfaffmann, AIA*
**Engineers:** *R. M. Gensert & Associates (structural); RAY Engineering (mechanical); LTI Lichttechnik Heiko Schnetz GmbH, with Siemens and Zumtobel (lighting); Hornfeck Engineering (electrical and telecommunications); AMP, with Siemens and Johnson Controls (data, voice, and controls)*
**General Contractor:** *TEDCO Construction Corp.*

**Size:** *7,000 square feet*

Carnegie Mellon University recently opened the Robert L. Preger Intelligent Workplace, a 7,000-square-foot laboratory where the newest and most advanced environmental components for the workplace of the future are tried out. The laboratory is not an actual office or even a simulation of one. Rather, it is a high-tech setting where professors of architecture and their graduate students in the Center for Building Performance and Diagnostics, a division of Carnegie Mellon's School of Architecture, study, test, and assess the effectiveness of new products and office systems.

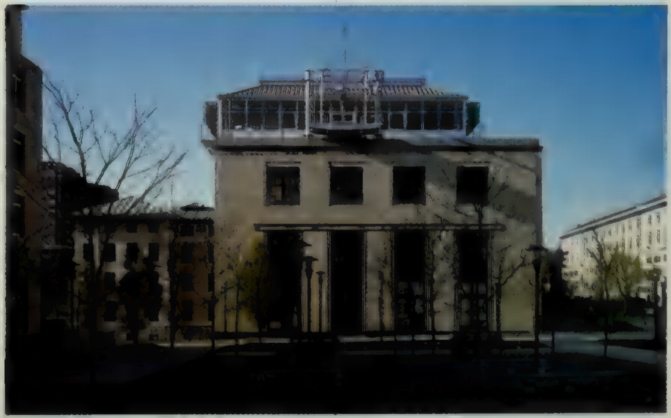
The environmental characteristics of the building envelope itself and the mechanical and electrical systems are also continuously studied, since they affect the office setting and, therefore, the performance of the worker. There is no fixed arrangement of cubicles, desks, or walls. Instead, experimental layouts are planned, erected, studied, improved, evaluated, and then replaced by new systems, which are put through similar paces. Only Volker Hartkopf, director of the center, and his handful of associates occupy a full-time office environment, though even this is subject to revision.

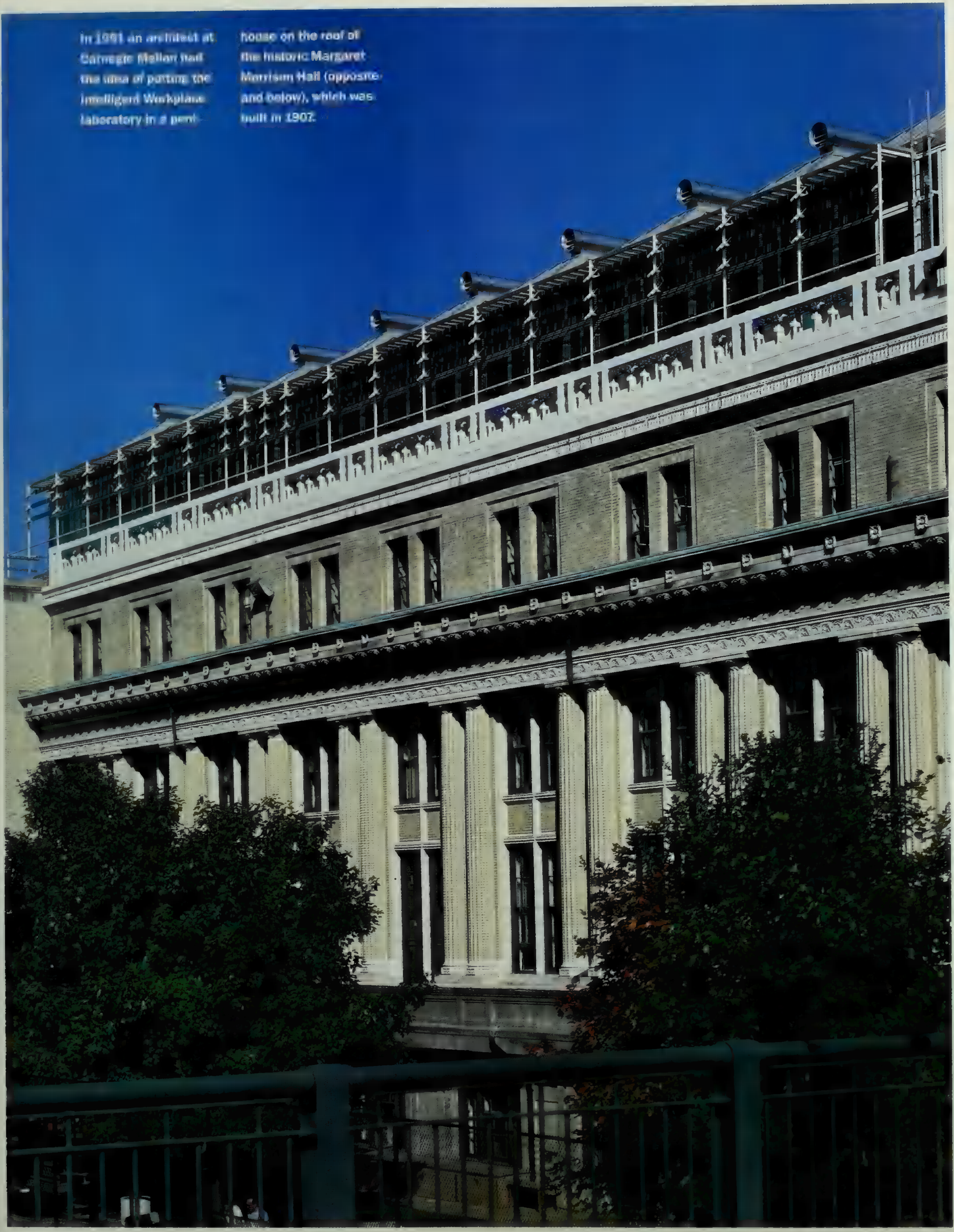
*Mildred Schmertz, FAIA, is a former editor-in-chief of* ARCHITECTURAL RECORD.

The Intelligent Workplace occupies a new penthouse designed by Bohlin Cywinski Jackson. It sits atop Margaret Morrison Hall, designed by Henry Hornbostel and completed in 1907. Formerly home to the women's college, Morrison Hall now holds classrooms. The penthouse solution for the expansion was first conceived in 1991 by Pierre Zoelly, a Swiss architect who was a student and, later, a teacher at Carnegie Mellon's architecture school. He was looking for ways to expand the hall without destroying its character.

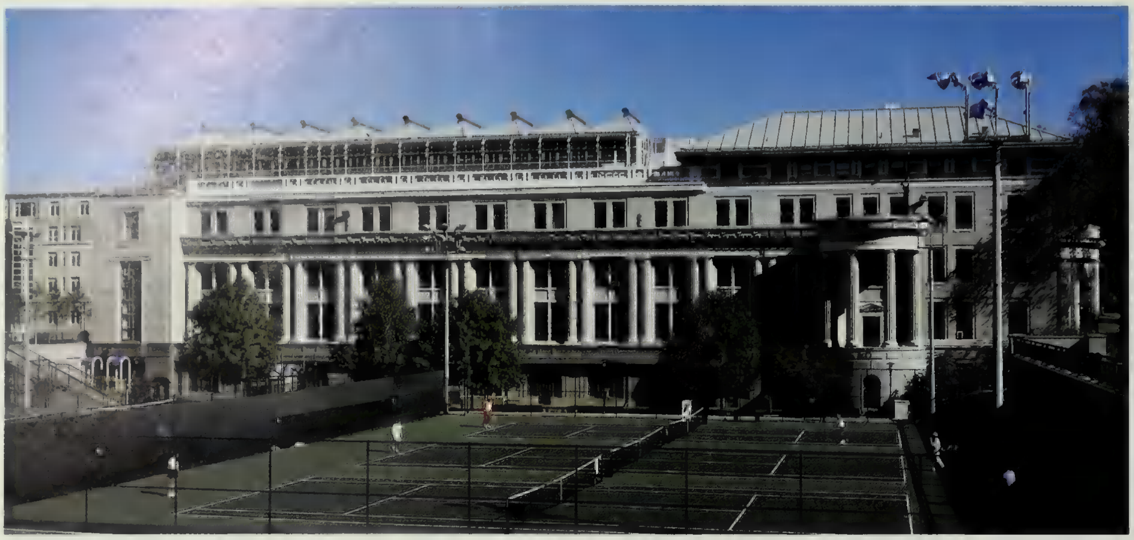
Established in 1988 by a consortium of university, industry, and government researchers, the objectives of the Intelligent Workplace include devising systems and products that improve the health, motivation, and productivity of office workers throughout the United States and around the world. They also look for ways to make the office buildings themselves more cost-efficient and flexible. These goals were created by a multidisciplinary team led by Hartkopf and including Zoelly, Bohlin Cywinski Jackson, and various structural, mechanical, and electrical engineering consultants.

According to Hartkopf's research, post–World War II office buildings are notorious for the lack of attention paid to HVAC, lighting, air quality, acoustics, and the other "hidden" components of workplace infrastructure. That's partly because American business was growing so rapidly that buildings went up without a lot of thought to worker comfort, and partly because corporations were unwilling to invest in systems that would accommodate such needs. The result, Hartkopf

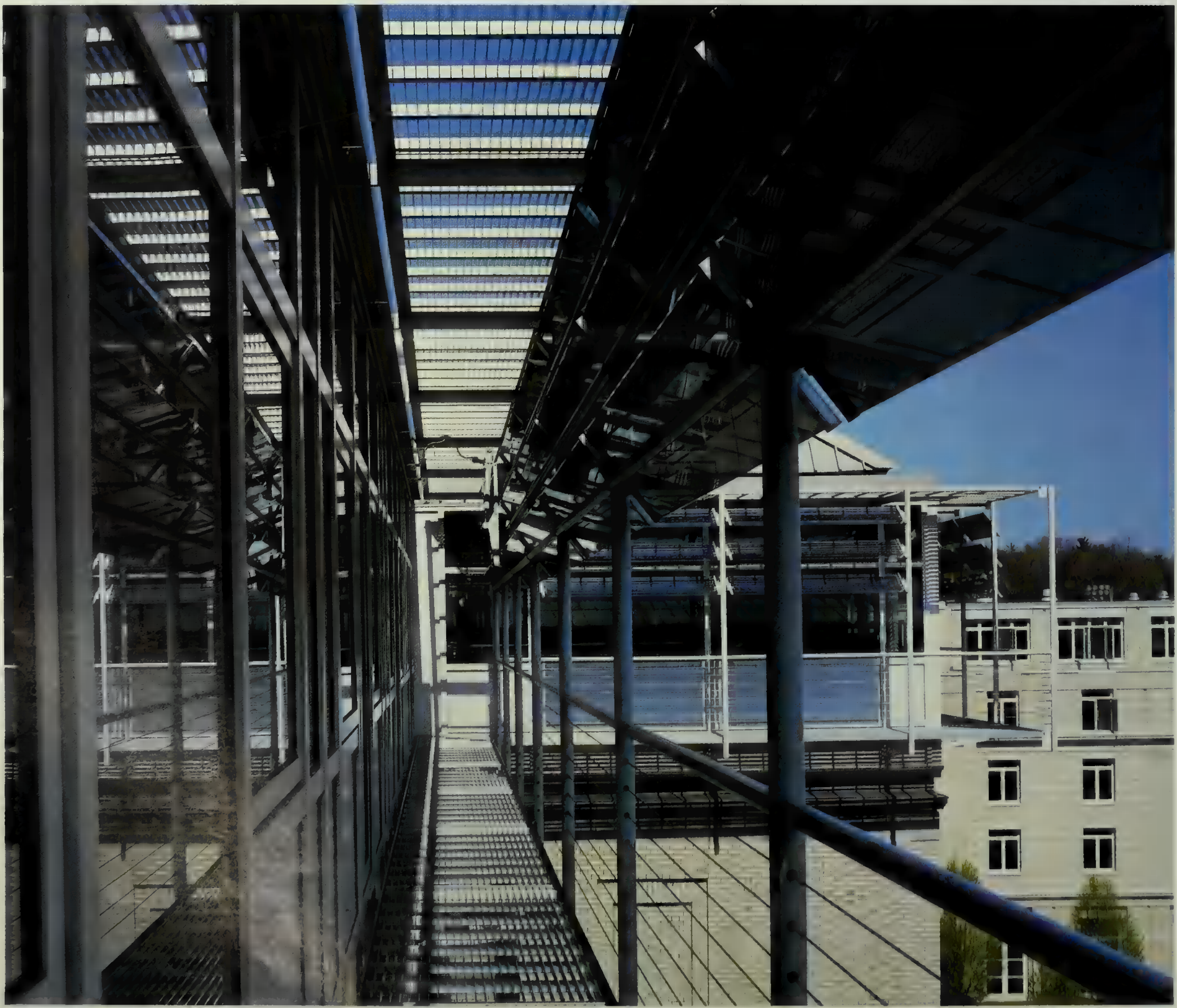


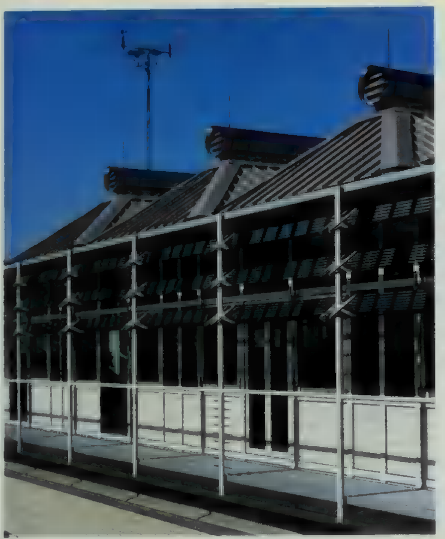


In 1991 an architect at Carnegie Mellon had the idea of putting the Intelligent Workplace laboratory in a penthouse on the roof of the historic Margaret Morrison Hall (opposite and below), which was built in 1907.

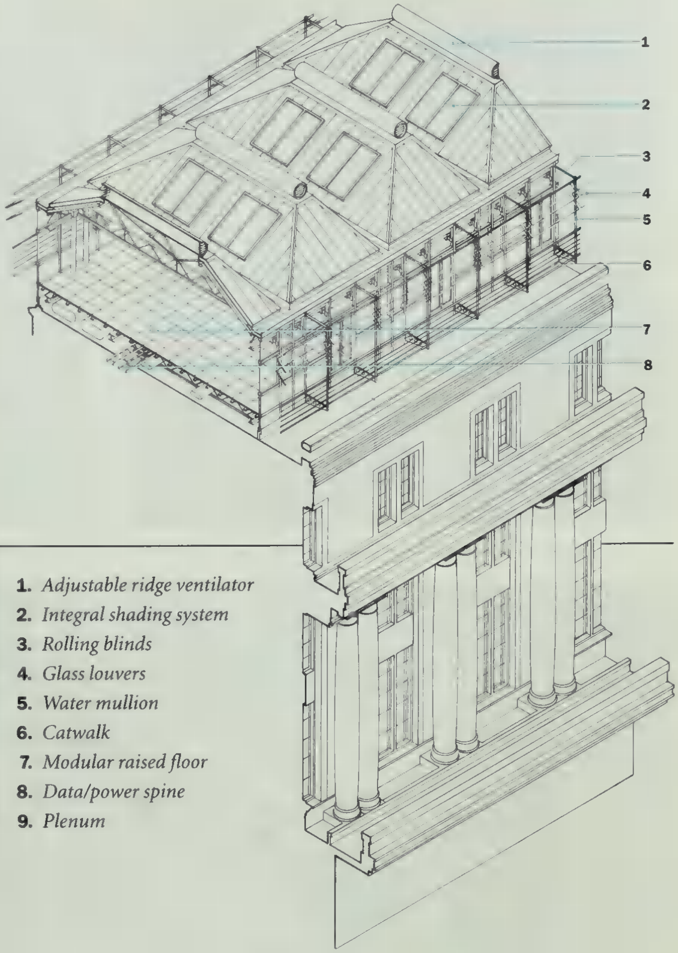


The sawtooth roof (left) provides room for skylights and for solar panels, to be installed soon. It also diminishes the weight of the penthouse addition, helping it blend with the rest of the building. Louvered shading devices above the catwalks help mitigate heat and glare.

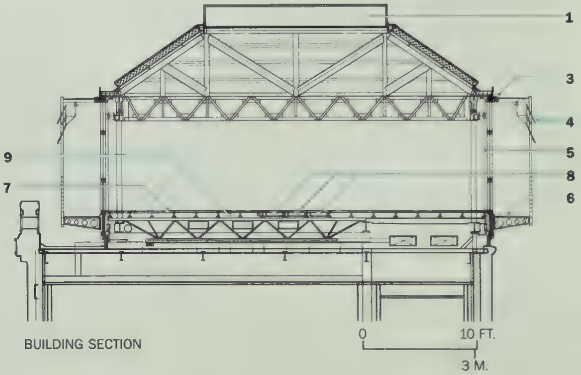




**Glass louvers shade the windows and reduce glare (left). The six-inch-deep floor plenum (right) contains a central spine of data and power cabling. Heat, air-supply, and white noise controls at each workstation plug into this spine and the adjacent ductwork.**



1. *Adjustable ridge ventilator*
2. *Integral shading system*
3. *Rolling blinds*
4. *Glass louvers*
5. *Water mullion*
6. *Catwalk*
7. *Modular raised floor*
8. *Data/power spine*
9. *Plenum*



says, was poor health and inefficiency among workers, as well as high energy and maintenance costs.

The steel frame of the penthouse consists of nine column-free bays on 16-foot centers. The penthouse floor lies three and a half feet above the hall's roof level, leaving space for the standard bar-joist floor structure and a six-inch-deep plenum. The main data/power distribution spine is threaded through this plenum. Passing through the joists are the underfloor return air ducts and the main supply air spine.

Getting power and data services where they are needed has become a significant problem as technological requirements have increased. At the Intelligent Workplace, a modular, highly sophisticated new floor system, which includes data connections, outlets, and other services, goes beyond the typical raised floor. It also provides excellent sound absorption and high durability.

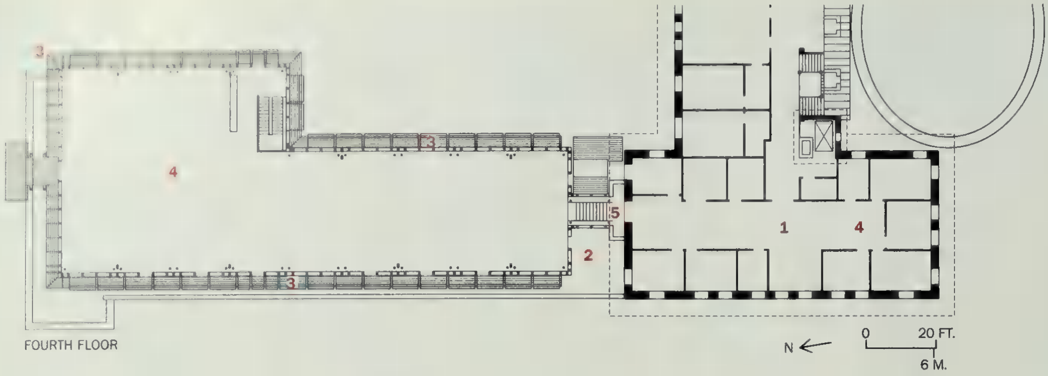
The roof of each bay is supported by paired structural steel trusses, one on each perimeter, and carried by four columns, forming a tablelike module. The truss construction provides an open horizontal plenum for continuous power/data/voice networking and easy reconfiguration of the HVAC system. Made of recycled steel, the system was bolted together in the factory for minimal waste. In the future, these tables can be disassembled and relocated elsewhere. While the Intelligent Workplace is unlikely to move its quarters, the system could be applied to corporations in need of good office space that's movable.

The asymmetrical sawtooth roof maximizes solar orientation and breaks down the scale of the structure, making it more sympathetic with the roofscape of the original building. The roof will eventually support photovoltaic panels to help power the center's heating and cooling system. Skylights with fritted glazing introduce soft, even daylight while avoiding glare.

A daylight sensor on the roof feeds data to a lighting control panel that switches ambient lighting on or off, according to daylight levels, within the structures zones. The panel reduces energy costs by allowing the building personnel to program facility-wide lighting levels. Wall-mounted luminaires provide dimming, programmable lighting, and centralized control.

The high-performance glass curtain-wall system balances indoor and outdoor environmental conditions with a water-flow mullion system. The wall automatically adjusts shading devices, which include exterior rolling blinds that admit sunlight on cold days and provide shade on warm days. Both the east and west faces of the penthouse have computer-controlled, movable glass-louvered sunscreens, which are mounted on projecting catwalks. The walls contain operable sash to admit fresh air at every workstation.

The building interior is an "intelligent village," a space that encourages interaction while allowing the workers to withdraw into privacy "coves." The faculty and graduate students who staff the center work with major vendors of workstation technology to test new configurations and provide feedback on how to more fully integrate their products with HVAC, lighting, and ergonomic technologies. Modular interior components are being tested that will, for example, allow a conference room to be quickly constructed from several offices for a special meeting, or multiple small offices to be created from large



**Daylight floods workstations (below), helping workers feel more connected with nature. Abundant natural light also means less artificial light, which saves money. Operative windows at each desk make this space a far cry from the hermetically sealed offices typical of the 1970s and '80s.**

1. *Existing floor of Morrison Hall*
2. *Outdoor terrace*
3. *Catwalks*
4. *Open office area*
5. *Stair from penthouse to Morrison Hall*

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**The Intelligent Workplace is essentially an open laboratory where office components are tested (far right). Each experimental workstation is equipped with an innovative, energy-saving environmental control system (right). The steel truss system (below) is made of recycled material.**

ones without wasting time and materials.

The Intelligent Workplace project seeks to persuade all those who are concerned with the design, construction, and furnishing of work environments that it's time to put an end to such pervasive problems as thermal zones that are either too hot or too cold but that workers have no control over; uniform overhead lighting that cannot be programmed by employees; snarled cables and technology connections; limited access to natural lighting and outside views; and offices that let in noise from adjacent manufacturing centers or highways.

The workstations set up in the laboratory give each occupant the ability to control the thermal, visual, acoustical, and air-quality characteristics of his or her microenvironment. The worker can change the temperature of the immediate work space, adjust task lighting, or easily move a computer or phone to another work space.

A desktop "environmental control module" allows workers to control air flow, temperature, and noise level (by means of a low-volume electronic sound screen) within the workstation. The module senses when the desk is unoccupied and automatically adjusts to a setback mode. These systems significantly reduce the amount of energy that would normally be used to heat or cool the entire office while offering a greater level of individual comfort. In addition, students and researchers can monitor the performance of the entire system.

Direct access to the underfloor mechanical and electrical infrastructure allows users to quickly and safely reconfigure their setting to meet changing organizational and technological needs. Zones and connections can be added and removed as required. Obsolete or damaged systems are easily disconnected, while new technologies are simply plugged in and tested. This unique "plug-and-play" technology eliminates the usual budget problems and time constraints that are involved when equipment must be changed.

The modular rhythm of the penthouse facades expresses the program and structure of the Intelligent Workplace, instead of echoing Hornbostel's classical module. Nevertheless, the structure appears elegant and graceful behind the original bold and beautiful terra-cotta cornice. The sawtooth profile of the penthouse roof and the lightness and delicacy of the glass-and-steel structure enhance the historic landmark building. ■

**Sources:**
**Glass curtain wall:** *Josef Gartner & Co.*
**Structural steel supplier:** *Nucor-Yamato*
**Steel fabricator:** *Littel Steel*
**EPDM roofing:** *Versico*
**Glazing:** *Viracon, PPG*
**Skylights:** *Viracon, WASCO, Bayer USA, Extech*
**Environmental controls:** *Johnson Controls*
**Lighting controls:** *Siemens Energy and Automation, Zumtobel Staff Lighting*
**Acoustics:** *Armstrong World Industries*
**Flooring:** *MAHLE*
**Office furniture:** *Steelcase, Inc./Grahl Industries, Inc.*
**Carpeting:** *Interface, Inc.*

## 3

# Silicon Graphics Mountain View, California

### KEEPING A COMPANY FULL OF COMPUTER GENIUSES HAPPY REQUIRES ATTENTION TO TECHNOLOGICAL NEEDS AND PLENTY OF AMENITIES.

**by Cathy Lang Ho**

**Project:** *Silicon Graphics Amphitheater Technology Center, Mountain View, California*
**Owner:** *Silicon Graphics Computer Systems, Inc.*
**Architect:** *Studios Architecture—Erik Sueberkrop, FAIA, David Sabalvaro, AIA, Charles Dilworth, AIA, principals; Lawrence Rugg, Clifford Wong, Neil Wallis, Stuart MacDonald, Sarah Wilmer, AIA, Jeffrey Benningfield, Jaden Fong, Helen Kim, Anders Hench, Jolie Kerns, Fredric Sherman, AIA, Tom Pinkowski, David Ogorzalek, Lawson Willard, AIA, Daniel Lewis, Yung Chang, Nicolo Bini, Kelly Haegglund, Paul Kinley, Angela Blosen, Colin Walker, Bob Bradsby, AIA, Timothy Crum, Amy Adamson, design team*
**Engineers:** *GFDS (structural); Sandis, Humber, Jones (civil); Ackerman Engineers (electrical); Encon (M/P/E); Woodward-Clyde (soils); The SWA Group (landscape); Schirmer Engineering Corp. (fire protection)*
**Contractor:** *DEVCON Construction Inc.*

**Size:** *500,000 square feet*

The Silicon Valley is legendary as the cradle of electronic civilization, but first-time visitors to this technological mecca are always surprised to find that the physical environment is uninteresting, architecturally and otherwise. At odds with its image as the gleaming cauldron of creativity, Silicon Valley is a sprawling, undifferentiated landscape, with relentless roadways slicing between bland office buildings and residential subdivisions. Rather than projecting glitz or grandeur, the valley's buildings are inwardly oriented, from ranch-style tract homes to mile-long shopping malls to airtight office boxes set in seas of asphalt parking lots.

Part of the valley's identity problem is the local architecture's emphasis on flexible, inexpensive space—essential for companies that can't imagine the future beyond their next quarterly earnings report. Experience has shown that departments can double in size, split into fragments, or disappear altogether in less time than it takes for the paint to dry.

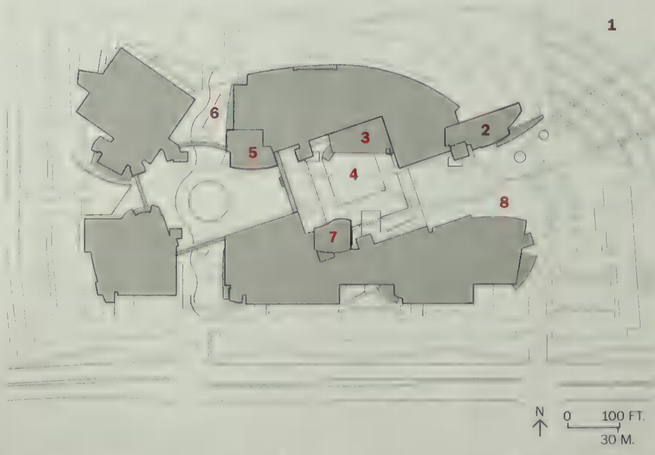
But even older, more stable Silicon Valley firms, like Hewlett-Packard and Intel, have, in the past, consciously commissioned buildings that say nothing about what's going on inside and are oblivious to their surroundings. Secrecy pervades the technological development scene, and most companies would rather invest in product research and development than in something that requires as much physical and financial commitment as good architecture.

However, now that the Silicon Valley ranks as one of the most expensive real estate markets in the United States, companies are finding it as economical to commission original architecture as it is to lease and modify generic space. As a result, the architectural landscape is about to improve.

The new 500,000-square-foot research and development headquarters for Silicon Graphics Computer Systems, Inc. (SGI), designed by Studios Architecture, may be one of the early standouts. SGI manufactures high-end 3D animation hardware and software that are the cornerstone of the film world's special effects industry and were used to create, among other movies, *Jurassic Park, Twister,* and *Flubber.*

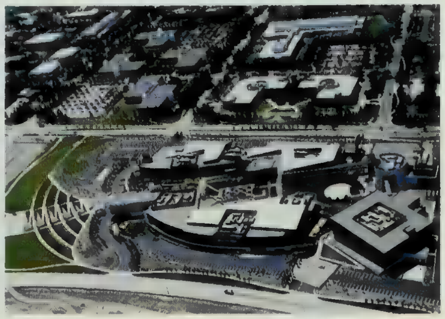
The new, four-building campus, in Mountain View, fulfills the basic Silicon Valley demand for flexible space while addressing issues important to this manufacturer in particular: easy and ample distribution of electricity and data; natural lighting (unusual for glare-wary computer firms); and, most of all, a

*Cathy Lang Ho is the editor of* Design Book Review, *a literary design journal based in Berkeley, California.*



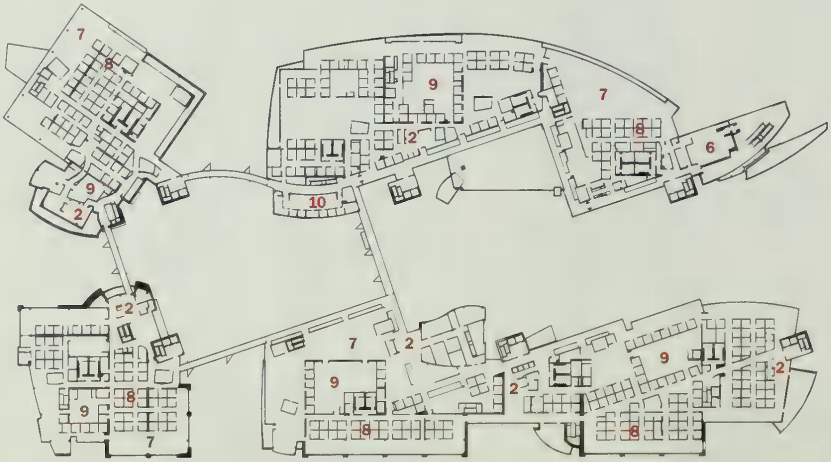
1. *Public park*
2. *Presentation center*
3. *Dining area*
4. *Outdoor dining*
5. *Library/fitness center*
6. *Bocci ball court*
7. *Theater/training center*
8. *Employee park*

SGI's colorful buildings in surprising shapes (left) are in sharp contrast to the dull architecture typical of the rest of the Silicon Valley. The campus-like setting (below) is meant to encourage exploration, collaboration, and competition. Courtyards (bottom) provide informal meeting places.

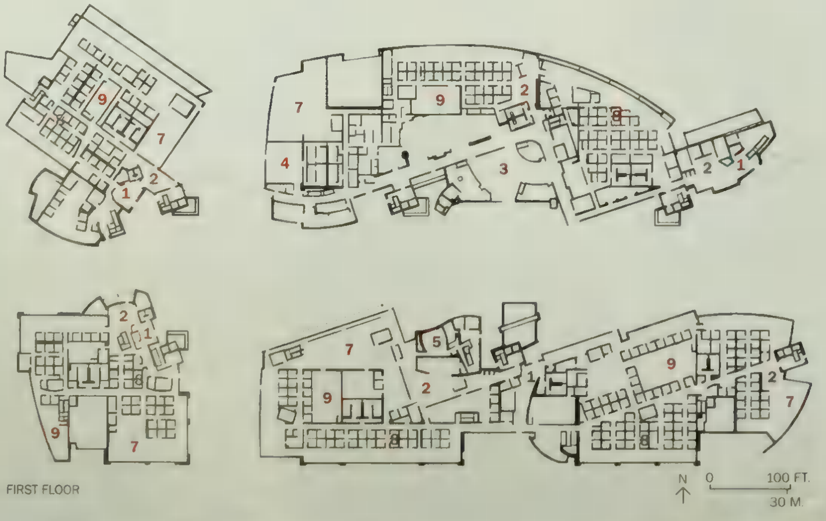


**SGI's buildings are organized around 15,000-square-foot floorplates, which bring a smaller scale to the 500,000-square-foot campus. Unique shapes give the buildings identity, creating landmarks and providing employees with a sense of neighborhood.**

1. *Entry*
2. *Coffee bar*
3. *Cafeteria*
4. *Fitness center*
5. *Theater*
6. *Presentation center*
7. *Open office area*
8. *Hardwall office area*
9. *Laboratory*
10. *Library*



SECOND FLOOR



FIRST FLOOR

congenial, inspiring environment for its prized, mostly wunderkind employees.

Studios Architecture is a favorite of the high-tech community, with a client roster that includes techno-stars like 3-COM, Novell, Quantum, General Magic, and Fore Systems. In designing for such clients, the firm has developed a keen sense of what works best for companies who must strive to keep their employees happy. For example, they have found some basic features to be effective, such as 15,000-square-foot floorplates, a feature they carried over from their design of SGI's highly stylized marketing/gateway building, completed in 1995. The architects have found that floorplates that size are big enough to be cost-efficient and easily divisible, yet small enough so that employees don't feel lost—a genuine dilemma for firms that hire and fire en masse.

"The scale of these 'neighborhoods' feels small," says principal Erik Sueberkrop, noting the clear sightlines across the floors and the central courtyard to the buildings opposite. "The advantage is that the forms of smaller spaces can be more energetic than those of behemoth buildings, and they can take on distinct personalities depending on their use."

The floorplates also lend themselves to being creatively arranged

**Most of SGI's amenities are located on the courtyard sides of the buildings (right). The "gourmet" cafeteria seats 500, and there is space for outside dining (below). Outdoor pathways connecting the buildings are reminiscent of a college campus (below).**

in the larger plan, which in this case includes two elongated, two-story, shed-roofed buildings that border the long sides of the 26-acre site, and two three-story square buildings that anchor the end opposite the main entry.

Interior expansion is abetted here by the custom-manufactured furniture system. SGI and Studios devised a system in which primary cubicle walls, or spines, do double duty as data and power carriers. Standard wall panels hook into the hard-wired spines, allowing workstations to be reconfigured with ease. If, for example, one department gains a manager who needs an expanded cubicle, the officescape can be altered without disrupting the work of surrounding employees.

SGI's workplace also departs from the corporate norm in its distribution of private offices and open cubicles. Only the engineers—the brains of the outfit, whose work demands quiet—have the option of a private office. Everyone else, from the chief executive officer on down, works in exposed cubicles.

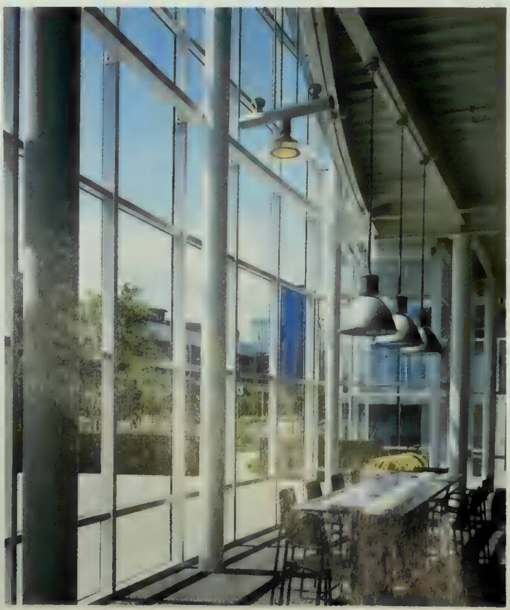
To dispel the typical equation of status and space, and to ensure that everyone enjoys natural light and views of the outside, the hard-walled offices are in the middle of the space, leaving the glazed perimeters open. Natural light also enters through clerestories, which face north to reduce glare on the computer screens. The permanent, private offices sit like boxes beneath the soaring loft roof. Because their walls are only 12 feet high, natural light flows around them, infiltrating areas far from the windows.

"The job of the architecture is to provide the staff with settings that will help them do their jobs," says Studios principal Charles Dilworth. "Engineers need peace and quiet when they are programming, but they also need to get out of the office and connect with others. It's like fish who live in a coral reef and come out every so often to swim in a school."

The work culture responsible for the Silicon Valley's astounding technological ferment is folkloric, fed by tales of company-organized sports tournaments, concerts, bashes, and vigilantly casual workplaces. This corporate philosophy means that budgets allow for such amenities as lounges, coffee bars, gyms, and gourmet cafeterias to keep the jeans-clad geniuses happy, productive, and loyal.

The college campus is the obvious model for most of the newly built, or soon-to-be-built, Silicon Valley offices. The intention is the same: to provide a liberating atmosphere that encourages exploration, competition, and collaboration. At SGI's campus in Mountain View,

Wood detailing, brilliant colors, and comfortable chairs help to create interior spaces that are playful and not too high-tech (right). Ready views to other parts of the campus make the complex feel smaller and more personal, while windows connect employees to the outdoors (below). The cafeteria keeps employees on campus and encourages impromptu meetings (bottom).



lounge areas and coffee bars, appointed with whiteboard-topped tables for doodling, dot each neighborhood. Walls are painted vibrant colors, an inexpensive and impermanent way to enliven otherwise basic spaces while visually encoding each neighborhood. The wild colors project an air of fun and are closely identified with SGI's trademark purple-and-teal workstations, anomalies in the gray and beige world of computer equipment.

The campus plan centers around an inner quadrangle—a place for workers to hang out and collaborate. The orientation of the quad and the geometry of the buildings' inner facades form a diagonal axis that points to SGI's gateway building. Paved pathways lead the way from one building to another and help orient new employees and visitors.

The courtyard-facing sides of the buildings are devoted to public amenities, such as the 500-seat "cafetorium" and an outdoor terrace. There's also a theater/training center housed in a slightly undulating volume with wood-sided walls, an earthy contrast to the buildings on the rest of the campus, with their glass curtain walls and white and gray aluminum panels. The pale, Alaskan yellow cedar siding is intended to evoke old wooden schoolhouses.

The campus, which sits slightly above ground level, is built atop a concrete parking podium, which eliminates the need for a monolithic parking structure or the acres of parking that traditionally distance buildings from the street (though some street-level parking was still necessary). Workers don't have to hike to their cars; they need only descend a flight of stairs. This more urban approach is a response to the region's rising land values and an attempt to make the buildings more accessible from the street—an unusual approach in the valley of high-security office parks.

The campus's central quad connects to a five-acre park surrounding the formal entrance. A gift to the local residents from SGI, the park was given in exchange for the long-term lease to this desirable site, granted by the City of Mountain View. The park, together with other public amenities and retail spaces that are gradually appearing in Silicon Valley, suggests that the barren architectural landscape there is slowly becoming more interesting as the valley develops an urban character. ■

**Sources**

**Curtain wall:** *Mitsubishi*

**Glazing:** *Walters & Wolf, Inc.*

**Precast panels:** *Lafayette Precast*

**Metal roof:** *Berridge Manufacturing*

**Locksets:** *Schlage*

**Office furniture:** *Herman Miller*

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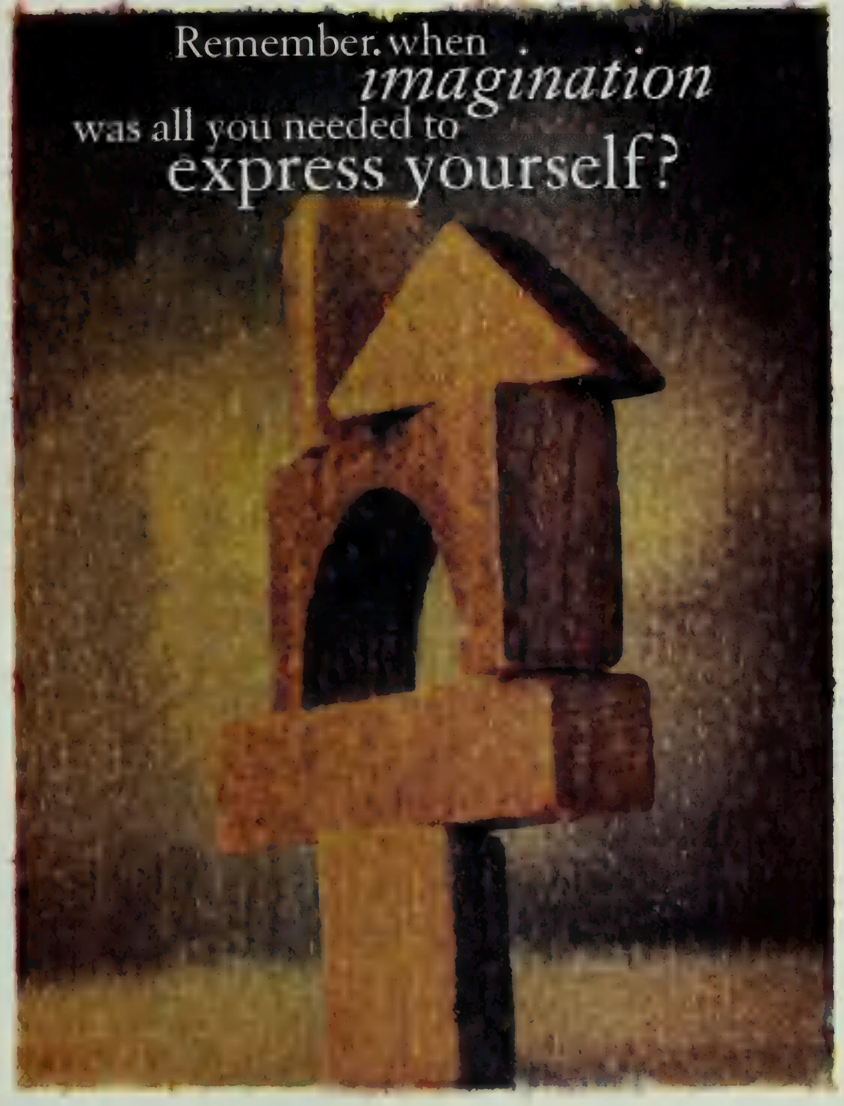

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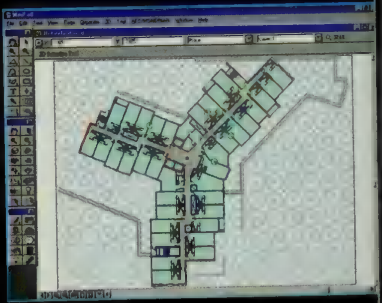

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**by Steven S. Ross**

Even if you stay at the A/E/C Systems show for the full three days, it's impossible to see everything. This year is no exception: the exhibition, which runs from June 2 through 5 at McCormick Place in Chicago, will be huge. But it's a great opportunity for architects and other building professionals to see state-of-the-art computer software and hardware systems—from more than 500 exhibitors—all under one roof, albeit one very big roof. With a little advance planning, you're sure to get a lot out of the experience. Here are a few helpful tips.

The show is organized into subshows, so you can usually find what you're looking for concentrated in one section. Some are sponsored by individual vendors, like Autodesk, Bentley, and Visio; others cover a specific category of products. The EDM/PDM Expo, for example, targets the managers of technical documents, product data management, and drawing file conversion software. The E/NET show features the latest in Internet, intranet, and extranet technology.

It's fun to wander through the exhibits, but since your time is probably limited, it's a good idea to make a list of must-sees. But don't be a slave to your list. Remember, the unexpected item that would really help your practice might be just around the corner. Explain your exact needs to booth personnel before they start their standard sales pitch. You may learn immediately that what they're selling isn't for you and save everyone's time. If you are interested, listen to their standard presentation. But be sure to pipe up when you don't see or understand what's going on.

With software, pay attention to the equipment used in the demonstration. Bear in mind that a dual-processor 333 MHz behemoth with 256 MB of RAM might run 3D software like a dream, but all that power may not fit into your budget.

Question salespeople carefully, and look for hidden costs. Many of today's products, for instance, won't run without ODBC-compliant database software, which, depending on your network setup, can cost anywhere from a few hundred to several thousand dollars to install if you don't have it already. And be sure to ask about support and maintenance contracts. Major CAD manufacturers are all heading for "subscription-style" support, just like the mainframe vendors of old.

If you're close to a purchasing decision, don't be shy about bringing a few test files of your own to the show. It's the best way to learn if the program you're eying is compatible with what you already own, and whether you like working with it. Talk to other potential or existing users—and be on the lookout for user-group meetings. You can also meet kindred spirits at various seminars and tutorials.

### CAD and 3D software to look for

At its show, Autodesk will announce a version of AutoCAD 14 specifically for architects called AutoCAD Architectural Desktop, and rumor has it that Bentley Systems will announce a new version of the TriForma 3D package for architects at its subshow. Other software on exhibit: the latest releases of MiniCAD (manufactured by Diehl Graphsoft), ARRIS (Sygma Design), ArchiCAD (Graphisoft), Architrion (BAGH Technologies), IntelliCAD (Visio), and Vdraft (SoftSource).

Visitors to the A/E/C Systems show say you'll get the most out of your time on the exhibition floor by planning ahead.

### Internet solutions at E/NET

The highlight of E/NET '98 will be software that lets you share drawings and other documents over networks, especially the Internet. Look for Diehl Graphsoft's Revision Master, which tracks changes to files using a central repository, and Aspects from Framework Technologies Corporation, for project-specific Web sites.

Cyco International will show the latest version of AutoManager WorkFlow. Also look for a document-management outfit called Pigeon Hole and Spicer's imaging software Imagenation. Cubus Corporation's Review It is a nice file-sharing tool.

### Hardware highlights

Silicon Graphics will launch a new line of Intel-based computers this year. Look for CPU upgrades like the MXPro from Evergreen, a $200 part that can triple the speed of an old 75 MHz Pentium. New scanners and printers will be offered by CalComp, CADNET, Image Scans, Xerox, Ricoh, GTX Corporation, HP, Ideal Scanner & Systems, Oce-USA, softelec's HybridCAD Sunscan, and Zeh Graphic Systems.

To get the most of the A/E/C Systems show, take 20 minutes before you go to think about and make a list of what your computing needs will be, next month, next year, even five years from now. Then plan your time wisely. ■

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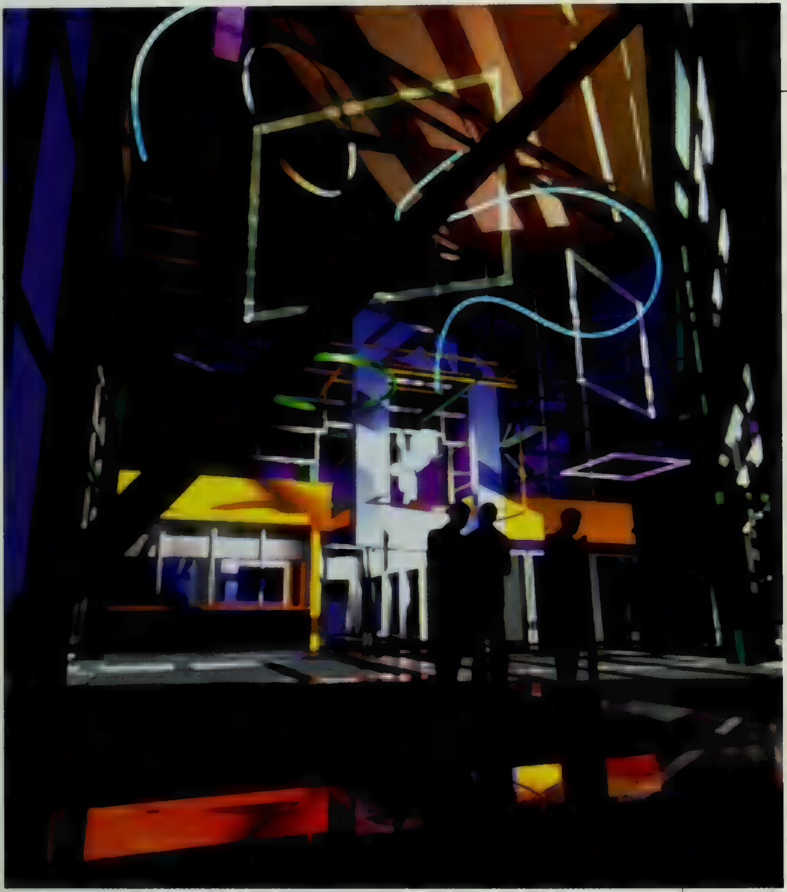
# Entering the Third Dimension

## INCREASINGLY SOPHISTICATED SOFTWARE AND POWERFUL HARDWARE ARE CHANGING THE WAY ARCHITECTS WORK. BUT IT'S STILL TOO SOON TO CLOSE THE DOOR ON 2D.



**by Steven S. Ross**

Architects have been debating the merits of 3D visualization for years. Is it worth the expense, time, and trouble? Will today's powerful new software and hardware allow architects and other construction professionals to use 3D as easily as they used 2D a few years ago, or even more easily? Would the amount of time and money firms invest in 3D be better spent on other equipment or services for clients, such as site supervision and better 2D documentation for the building's life cycle?

Vendors of CAD and specialized suppliers of 3D software answer that because 3D software represents buildings being drawn onscreen as if they were solid, "real" objects rather than collections of wireframe-like lines, 3D makes designing buildings easier and less error-prone. That's an advantage for both clients and architects. The disadvantage is that at this time, producing working drawings from 2D is still easier than producing them from 3D.

In a survey of large architecture firms conducted by software maker Bentley Systems last summer, 94 percent of principals responding ranked "collaboration throughout the building process" over "individual productivity" in their five-year automation goals. In other words, the capacity for design team members to turn 3D renderings and computer-generated concept drawings into computer files that can be used to create construction documents has become more important than the simple ability to draft.

This is a significant shift in architects' perceived technological needs. Over the previous five years, surveys by Bentley and others tended to show 80 to 90 percent of respondents focused on the desire for better drafting and drawing systems. As those wishes have been granted with a host of sophisticated programs, a more pressing need now is for them to work together. This creates a dilemma that only cheaper, faster hardware and even better software can solve. The computers and software available now do allow both collaboration between designers and powerful drafting, but not at the same time.

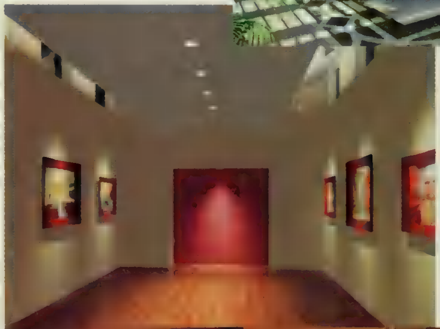
Equipment vendors have picked up on this trend. Last year, Hewlett-Packard, Dell, and Compaq expanded their lines to include Windows NT workstations equipped for CAD and 3D. They joined Intergraph and smaller firms such as NetPower and Tri-Star Computer, who were among the only national vendors of such equipment. IBM and Gateway 2000 joined the party late last year. This January, Compaq announced it was buying Digital Equipment Corporation, gaining access to Digital's superfast Alpha CPU.

The future of design software—the near future, in fact—belongs to 3D. But at this point in time, not all 3D programs are cost-effective. Video in particular is problematic, even if more clients demand it. Indeed, the "visual experts," producers of photorealistic renderings and videos who often run service bureaus for architects, still admit to resorting to trickery to make images look good. A close look at really great images reveals such oddities as semitransparent marble and wood, rogue extra "hidden" lights, and 2D objects that tilt or twirl so you always see them full-face in supposedly 3D renderings. These tiny, almost imperceptible details move the underlying 3D database a few steps closer to having a photorealistic quality.

It is clear that to vendors 3D software presents possibly the last big opportunity to change the dynamics of the industry, and thus to become competitive with Autodesk, whose typical annual sales of AutoCAD equal the combined sales of its major competitors. "We know we are not going to beat AutoCAD in the production end," says Serge

*Contributing editor Steven S. Ross has been reviewing software and hardware for this magazine for more than 11 years.*

**A gameroom (above) and courtyard (right) modeled in Sygma Design's ARRIS renders shades, shadows, water effects, and reflections nicely.**



**This radiosity rendering in Lightscape (left) shows light and shadow patterns well. Note the soft lighting effects in a bar rendered with Radioray from Kinetix (below).**

Bouhadana of BAGH. "So we are concentrating on the design end." BAGH Technologies' flagship production drafting product, Architrion, has 17,000 paying users ("seats") worldwide; Autodesk claims 3 million customers, mostly for AutoCAD.

Bentley Systems did score a big win in December, announcing that the nation's second largest architecture firm, NBBJ, had selected MicroStation TriForma to replace 330 AutoCAD seats. NBBJ principal and business manager Robert Klie III explains part of the firm's reasoning: "We recognized that two-dimensional drawings were losing their power. The developing relationship between entertainment and architecture was increasing the demand for work produced in three dimensions. Instead of just viewing drawings, clients wanted to walk through, fly through, live through the architectural experience."

Klie also notes that when NBBJ convened a task group on the subject two years ago, they could produce beautiful three-dimensional images, but they still needed the 2D CAD drawings to actually produce construction documents. Likewise, NBBJ was playing around with 3D for the design-concept stage but could not use the files generated at that point to kickstart the production-drawing cycle.

NBBJ explored Graphisoft's ArchiCAD and Bentley's TriForma as alternatives to AutoCAD. The first test had mixed results. In March 1997, NBBJ transferred the Burlington Healthcare project to TriForma. The project team was keen on trying 3D, but Bentley's TriForma trainers were still learning the software themselves, so almost all the standard details were still in 2D. NBBJ finished the project in 2D MicroStation instead. But 3D is becoming more common.

## 3D goes public

The public has become accustomed to 3D wizardry, partly because so many cities have been beneficiaries of 3D modeling. For instance, Bill Jepson, director of computing at UCLA's School of Architecture and Urban Design, is leading a team of architects and planners on a simulation of Los Angeles. They're using a Silicon Graphics Onyx2 and uSim software purchased in part with a grant from the City of Los Angeles Housing Department.

Three-dimensional renderings are easier to grasp than flat drawings, and since they've come into use Los Angeles has enjoyed broader-based, better-informed public involvement on redevelopment proposals. A virtual reality video at a hearing on the Village Center Westwood elicited a strong response from residents of Hollywood and Pico-Union: many felt that the project as designed was simply too big for the neighborhoods. After the hearing, the plans were scaled back, according to Jepson.

Although the "fly-through" software Jepson uses is great for images (Silicon Graphics based it on military flight-simulation programs), there's usually no provision for an underlying database. Merging geographic information systems (GIS) data with the simulation could make for an enormously useful planning tool, even for nonprofessionals.

## The state of the art

Three-dimensional representation technology today is roughly where 2D CAD was at the beginning of the decade: no one package can do everything. But many packages, covering the full range of architects' needs and budgets, can work together or stand alone. Here are just a few 3D programs, and the stages of a project where they tend to be most useful:

*Design concept.* Virtus Walkthrough Pro and ConceptCAD. Autodesk WalkThrough. Nemetschek Arch14, BAGH ArchiDesign and modeling packages such as auto.des.sys Form.Z.

# FINDING THE 3D SOFTWARE PROGRAMS THAT MEET YOUR NEEDS

**There is an almost** bewildering array of 3D tools, add-ons, and accessories available, so you may have to do some research before you find the exact item that fits your needs, budget, and equipment platform. They range from extremely powerful, costly programs, which require workstations with advanced processors, to the most basic, costing only about $50. Here is a rundown of some of the best-known products, including price information, a basic description of what the software does, and how to contact the vendors. *S.S.R.*

**3D Studio VIZ**
A subset of 3D Studio MAX, offering most of the features for under $2,000. Kinetix offers Radioray, a radiosity and ray tracing renderer that includes sunlight and luminaire calculators.
*Kinetix (division of Autodesk), 642 Harrison St., San Francisco, CA 94107; 800/964-6432; www.ktx.com.*

**Arch14 Modeler**
A $99 add-on for AutoCAD 14.
*Nemetschek Systems, 100 Shoreline Hwy. (B), Suite 125, Mill Valley, CA 94941; 800/479-0735; www.arch14.com.*

**ArchiCAD**
Versions available for Macintosh and Windows 95/NT. Price per seat is roughly $5,000.
*Graphisoft USA, 235 Kansas St., Suite 200, San Francisco, CA 94103; 800/344-3468; www.graphisoft.com.*

**ArchiDesign**
Available for Macintosh, Windows, and SGI Unix computers for $1,995. ArchiDesign runs extremely fast on the small Silicon Graphics O2 machine.
*BAGH Technologies, 4446 Blvd. St-Laurent, Montreal, Quebec, H2W 1Z5, Canada; 514/285-1717; www.BAGH.com.*

**ArchT 14**
An AutoCAd add-on, one of the cheapest ways to get 3D into AutoCAD ($495). Free trial available on the Web site.
*Ketiv Technologies, Inc., 6601 NE 78th Court, Portland, OR 97218; 503/252-3230; www.ketiv.com.*

**ARRIS**
Everything from 3D conceptualization to production drafting and design, in software that runs in Windows NT, including several Unix variants. Complete suite of drafting and modeling tools for architects lists for $4,200.
*Sigma Design International, 654 Madison Ave., New York, NY 10021; 888/990-0900; www.arriscad.com.*

**Autodesk Walkthrough**
A less-than-$200 add-on for the less-than-$3,000 AutoCAD 14.
*Autodesk, 111 Mcinnis Pkwy., San Rafael, CA 94903; 415/507-5000; www.autodesk.com.*

**ConceptCAD**
WalkThrough Pro, with a retail price of $495, offers good modeling tools and the ability to "walk through" your models by moving the mouse. ConceptCAD does even more, and comes with thousands of everyday objects prebuilt. The price is $1,595.
*Virtus Corp., 114 MacKenan Dr., Suite 100, Cary, NC 27511; 919/467-9700; www.virtus.com.*

**Form.Z**
Arguably the best stand-alone modeling package, with versions for Windows 95/NT and Power Macintosh. Versions below 3.0 (due for release soon) will run on Windows 3.1 and older Macintoshes.
*Auto.des.sys, 2011 Riverside Dr., Columbus, OH 43221; 614/488-8838; www.formz.com.*

**Lightscape**
Probably the best single stand-alone package for taking a 3D still image and rendering it in a pleasing, photorealistic way. List price: $595 for Windows 95/NT. Can also be used to design a light fixture or to estimate the effects of a light source.
*Lightscape Technologies (subsidiary of Discreet Logic), 1054 South DeAnza Blvd., Suite 200, San Jose, CA 95129; 408/342-1900; www.lightscape.com.*

**MiniCAD**
This low-priced ($795) Macintosh/Windows program gained a Boolean 3D in version 7. It supports QuickDraw 3D on the Mac.
*Diehl Graphsoft, Inc., 10270 Old Columbia Rd., Columbia, MD 21046; 410/290-5114; www.diehlgraphsoft.com.*

**PlantSpace**
A high-end product that works with MicroStation to scope out complex plant-design tasks (especially piping and valving) in 3D. This isn't really creative architecture, but it offers a sophisticated glimpse of one aspect of 3D visualization.
*Jacobus Technology, 7901 Beechcraft Ave., Gaithersburg, MD 20879; 301/926-0802; www.jacobus.com.*

**Poser 2**
Poser was originally developed by Fractal Design, which merged with MetaTools (formerly KPT for its flagship Kai's Power Tools product), in Spring 1997. Poser 2 is available for Macintosh and for Windows 95/NT. List price is $149, but usually discounted.
*MetaCreations Corp., 6303 Carpinteria Ave., Carpinteria, CA 93013; 805/566-6200; www.metacreations.com.*

**Simply 3D**
Expect to pay about $50 on the street for this animation and drawing tool.
*Micrografx, Inc., 1303 E. Arapaho Rd., Richardson, TX 75081; 972/994-6767; www.micrografx.com.*

**SolidBuilder**
Really a builder's product, but architects should pay attention. There are excellent 3D tools here, and a database system that treats 3D objects as entities for tracking costs and functionality.
*Eagle Point Software, 4131 Westmark Dr., Dubuque, IA 52002; 319/556-8392; www.solidbuilder.com.*

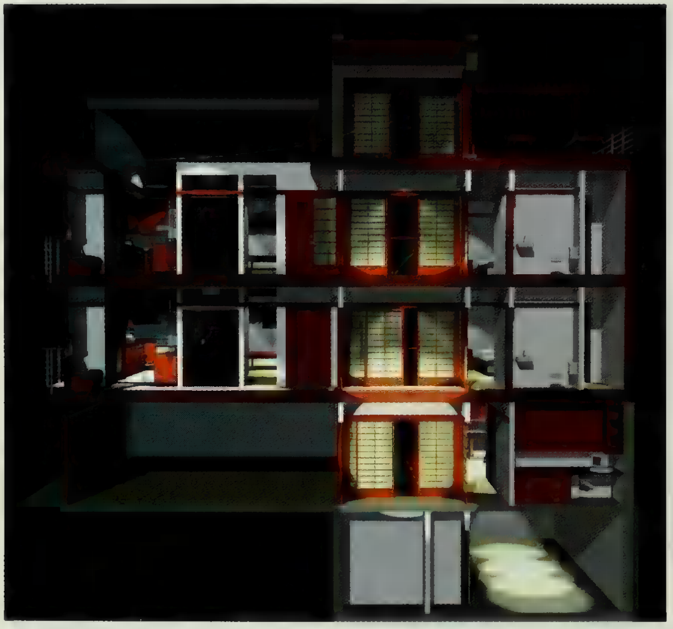
**TriForma**
An add-on for MicroStation 95. Overall cost for the seat will be roughly $4,000.
*Bentley Systems, Inc., 690 Pennsylvania Dr., Exton, PA 19341; 610/458-5000; www.bentley.com.*

**TrueSpace 3**
Typically sells for under $500, although the list price is $795. Originally developed for the movie industry, but has fairly good tools for creating and animating a scene, especially for walk-throughs. Produces VRML files. The Web site allows a demo download.
*Caligari; 1959 Landings Dr., Mountain View, CA 94043; 800/351-7620; www.caligari.com.*

**TurboCAD**
The firm, which specializes in low-cost CAD products, recently took over Corel's 3D modeler line, which will sell for higher prices.
*IMSI, 1895 Francisco Blvd. East, San Rafael, CA 94901; 415/257-3000, 800/833-8082; www.imsisoft.com.*

**VDraft**
A fairly close clone of AutoCAD at an attractive price, but it lacks some AutoCAD R14 features. You can download a demo and a free SVF (simple vector format) Web browser plug-in, or purchase better versions of the plug-in, from the VDraft and SoftSource Web sites.
*SoftSource, 301 W. Holly, Bellingham, WA 98225; 360/676-0999; www.vdraft.com.*

The Oxxo Calzada was modeled in AutoCAD and 3D Studio MAX by Guillermo M. Leal Llaguno (above). A section of the Nakamura residence in Osaka, Japan (below), was rendered by architect Curt Cline using ArchiCAD. Note the lighting effects.



*Detail design and design/drafting work.* AutoCAD with Softdesk AutoArchitect 8.0, Ketiv ArchT, Arch14, various Eagle Point products. CAD products such as BAGH's Architrion with ArchiDesign, Sigma Design's ARRIS, Bentley's MicroStation Triforma, Graphisoft's ArchiCAD. At the low-cost end, Diehl Graphsoft's MiniCAD, DataCAD, or Deneba-CAD.

*Client and regulatory presentations.* Kinetix 3D Studio VIZ, Lightscape, MetaCreations Poser 2 and Bryce, Caligari TrueSpace, Micrografx Simply 3D, IMSI Dream3D.

Depending on how you work and the types of projects you take on, packages can move outside the niches described above. Lighting designers, for instance, will certainly want to consider Lightscape, BAGH ArchiDesign (which includes Lightscape), or even 3D Studio VIZ, with its RadioRay plug-in, at the concept stage. Design Vision, a three-person architecture firm in Hawaii that specializes in high-end residential work, uses Lightscape's visualization tools with their clients rather than a strictly architectural 3D program.

3D Studio VIZ, basically an animation package, is often employed for preliminary "sketching out" of designs that will later be fleshed out in AutoCAD 14 (VIZ is compatible with AutoCAD 13 and 14, and can import and export their files). Likewise, TriForma is easy enough to use that designers can sketch with it in front of clients at the design concept stage. So is ArchiCAD. But to walk the client through the project at an early stage, a program like ConceptCAD is a better bet. Other programs do walk-throughs, but they're harder to work with and take longer.

Designers who like the Boolean functions—with which multiple solid shapes can be manipulated to form intricate models—in high-end CAD packages such as AutoCAD, MicroStation TriForma, and ArchiCAD—will probably find modeling packages such as Form.Z a bit more congenial than the modeling tools in ConceptCAD. But other designers will prefer ConceptCAD because of its speed and nice shape libraries.

BAGH ArchiDesign is marketed as being able to produce designs that can easily be converted to any CAD software (BAGH recommends its own Architrion, of course). But its drawing tools are fairly complete, allowing a designer to do a fair amount of hard-line drafting before switching over to complete CAD packages for production work. And ArchiDesign includes lighting and scene controls (from Lightscape, in part), which can come in handy after hard-line drafting is completed. ArchiDesign is not as interactive as packages such as ConceptCAD, but it models true solids and complex surfaces.

## COMMON VIDEO AND 3D FILE FORMATS

**AVI** Audio-Video Interleave. Lets you add audio to a video presentation. This feature doesn't work well for photorealistic presentations, because files tend to be huge, but less-detailed AVI files compress well. Modern Web browsers read AVI files automatically.

**FLC, FLI** Movie industry slang for "flick" formats. Originally intended for animation packages such as 3D Studio. As with AVI, compression is poor for "realistic" images.

**MPEG** Motion Picture Experts Group (developer of the formats). There are two flavors right now: MPEG 1, which comes with many computers, is easier to work with. Highlights in MPEG 1 images tend to develop "spikes" and other distortions, which may be quite pretty or quite distracting. MPEG 2 is near-perfect for photorealistic videos, but images in this format require machines with fast processors and a great deal of memory.

**QuickTime VR** Originally developed for Apple and now available for Apple and Windows computers. Lets you create and view 3D scenes interactively. It's not great for photorealistic scenes, but the images are better than cartoons.

**RealVR** Based on VRML and JPEG technology. Often confused with QuickTime VR, RealVR can produce smaller files with less distortion and larger screen sizes than QuickTime. There are versions of the RealVR "player," called Traveler, for both Windows and Macintosh. Requires a sophisticated production operation to use well.

**VRML** Virtual Reality Modeling Language. This is a common file format for 3D. Version 2.0 was finally approved as a worldwide ISO standard in late January. VRML can be read by modern Web browsers and allows 3D walk-throughs with no distortion. Files in this format are quite large.

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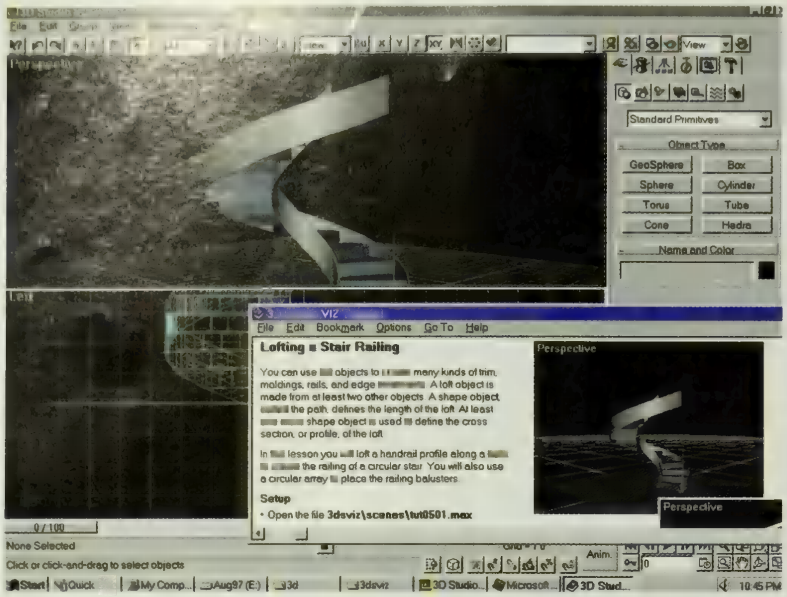


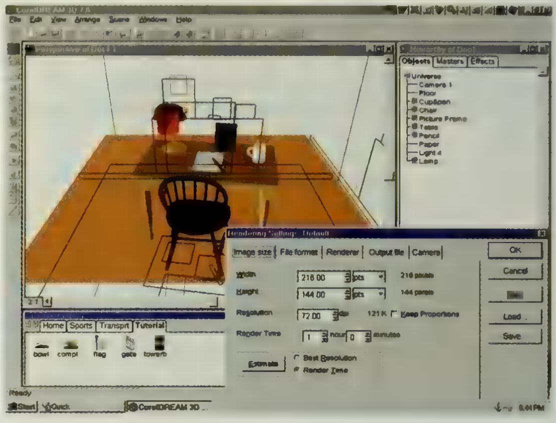
**Lofting [illegible] Stair Railing**

You can use [illegible] objects to [illegible] many kinds of trim, moldings, rails, and edge [illegible]. A loft object is made from at least two other objects. A shape object, [illegible] the path, defines the length of the loft. At least [illegible] [illegible] shape object [illegible] used [illegible] define the cross section, or profile, of the loft.

In [illegible] lesson you [illegible] loft a handrail profile along a [illegible] [illegible] [illegible] the railing of a circular stair. You will also use a circular array [illegible] place the railing balusters.

**Setup**

- Open the file **3dsviz\scenes\tut0501.max**



Width 218.00 pts 218 pixels
Height 144.00 pts 144 pixels
Resolution 72.00 dpi 121 K ☐ Keep Proportions
Render Time 1 hour 0 minutes
○ Best Resolution
● Render Time

**3D Studio VIZ can take a scene and render it, then animate it. If you don't know anything about video, 3D Studio**

**VIZ comes with fine tutorials (left). The view of the desk (above) was created in Corel-DREAM 3D.**

### There are speed limits

The current class of inexpensive Windows 95 or Windows NT desktop computers will handle almost any 3D task with ease. The one big exception is making full-screen photorealistic or near-photorealistic scenes. In one test, rendering an 800-frame scene (enough for about 25 seconds of video) with 3D Studio VIZ took 40 hours on a 200 MHz Pentium with 64 MB of RAM running Windows NT.

Moving up to more powerful equipment (a 300 MHz MMX Pentium and 128 MB of RAM) should cut that time to 12–15 hours. You can split the task, if you have a license to run the software on more than one computer, by instructing one to process half the frames and others to process the rest. Some of the more advanced packages allow one copy of the software to spread the processing around a network automatically.

The more advanced modeling packages have been fairly quick to learn drafting tools, but they are mainly for drawing and sketching. Even those that offer precise hard-line design usually fall short when it comes to production drafting needs: dimensioning, labeling, 2D representations, and so forth. Does it matter? If you use the modeling tool for conceptualizing an initial client feedback and then move the file into hard-line production drafting, you usually won't have any problem. But if you expect to go back and forth, you may want to stick to solutions that do not degrade the production work in a file translation step.

Consider the following options: TriForma with MicroStation or Softdesk/Autodesk AutoArchitect, 3D Studio VIZ, EaglePoint or Ketiv or Arch 14 with AutoCAD. Or a complete solution from BAGH (Archi-Design and Architrion), Graphisoft (ArchiCAD), Nemetschek (AllPlan), or Sigma Designs (ARRIS). At the low end, consider Diehl Graphsoft's MiniCAD or DenebaCAD as round-trip solutions that cost well under $1,000.

Transporting 3D is tricky. The easiest and perhaps cheapest technique is to write to a CD-R disk. Each holds about 65 MB of video or images, and can be viewed on any computer that has a CD-ROM drive. Drives that can write CD-R cost only $300 to $500. The blank disks themselves are under $2 if you shop wisely. ■

## 3D SOFTWARE AND HARDWARE TERMINOLOGY

**AGP** Accelerated Graphics Port. With the new Pentium II "cartridge" CPUs, Intel has created a faster link between the CPU and system memory. This promises to speed graphics processing. The best examples of AGP-enabled software right now are computer games. But you'll want AGP for next year's software if you do a lot of "realistic" 3D. The extra equipment cost now is close to nil.

**Boolean software** Allows you to create new shapes by adding to various shapes, combining them, or subtracting from them. A sphere partially intersected with a wall plane, for instance, can leave a Boolean "dimple."

**FX!32** Digital Equipment's software fix that lets most Pentium-based applications run on the DEC Alpha CPU. It can work well but not always at a big speed advantage, considering that the Alpha is a much faster CPU than the Pentium. Check carefully with your software vendor before you buy.

**Radiosity** Great for reproducing actual lighting effects. It calculates light emitted from a source but does not take multiple reflections fully into account. This makes radiosity calculations faster than ray tracing. It also puts a pleasing "glow" around point sources, especially in darker scenes that aren't fully lit anyway.

**Ray tracing** More accurately represents reflections and fine detail than radiosity. Software can be set for multiple reflections, which increases processing time but makes for great detail.

**Software Z-buffer** The typical default for Windows 95/NT display drivers. These drivers are essentially built into Windows and will work with minimal equipment. If your computer has a more advanced video card, use that card's drivers rather than the default.

**Threading** A feature of software that lets it distribute its computing needs among multiple CPUs in the same computer to get the work done faster. Even when a package is not threaded, it can work with no performance penalty in the background on one CPU while you work in the foreground on a different task using the second CPU in a multiprocessor system. These days, a two-CPU system might cost only $500 more than a single-CPU computer.

All images: ©1998 Urban Architecture, Inc.

# 3D architectural modeling at its best ...

## Urban Architecture,

of Dallas, Texas, is an award winning architectural design firm whose goal is to push the limits of today's computers and new technology in order to expand their capabilities and efficiency. How do they do it?

*Being a firm focused on design, it became apparent to us that, with the kind of time pressure clients are imposing on the design process, we needed to develop methods that would improve our efficiency and allow us to properly develop our ideas. Two years ago we began using form•Z for all of our schematic design. Today every project in the office moves from initial sketch diagrams directly into form•Z. The efficiency gains have been tremendous, allowing us much greater time to study the solution. We now design up to the last moment, setting up the batch renderer as we go home the night before a presentation.*

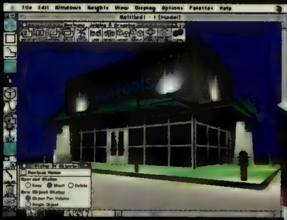
*Unlike many firms who have set up "media labs" and other specialized groups to do imaging in the office, we see this technology spreading to every desk in the office. We will soon reach the point that if you cannot use form•Z, you will be unable to participate in the design process.*

**Rick del Monte, AIA,** Urban Architecture

Left, top to bottom: **Northpark Central Competition,** Dallas, Texas; **Office building proposal,** Richardson, Texas; **Creekview Office Building,** Richardson, Texas; **Building study for the University of North Texas,** Denton, Texas.

Above: **Northpark Central Competition,** Dallas, Texas.

Below: **Jupiter and 190 Office/warehouse,** Plano, Texas.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## form•Z

As a designer, you need to visualize complex forms and to imagine shapes that do not yet exist. You frequently race against insane deadlines, while your clients grow impatient. That's when you need the modeling power of **form•Z**, which lets you create a vast variety of forms with great ease. It offers an extensive array of unique 2D and 3D form sculpting capabilities.

Grow a model from simple lines to complex **surfaces** or to true **solids** with a few quick clicks. Shape curved **splines** or **NURBS** surfaces as you slip effortlessly between 2D and 3D views. **Resize** your shape, **stretch** it, **extrude** it, **lathe** it, **sweep** it, **project** it, **unfold** it, **deform** it, apply advanced vertex and edge **rounding** to it. Use **metaformz**, smooth **meshing**, image-based **displacements**, or multi-source, multi-path **skinning** to create smoothly blended **organic** forms. What's more, **form•Z**'s **Boolean** operations work even better than those found on pricey workstation level modeling packages.

Add as many **layers** as you need, work with floating point **precision** using **graphic** and **numeric input**. If you are unhappy with your new design, **unlimited undos** are at your fingertips.

As you model, you can interactively view your creations in wire frame or smoothly shaded images using **OpenGL** (Windows) or **QuickDraw 3D** (Macintosh). You can also produce **QuickTime VR** movies and view them from within **form•Z**.

## RenderZone

When you are done modeling, you can use **RenderZone**'s state of the art shader technology to produce your photorealistic images at high speeds.

## RadioZity

If you need highly accurate simulation of lights, you can use **form•Z RenderZone RadioZity** for even more photorealism.

Or you can smoothly transfer your models into your favorite animation program, using one of **form•Z**'s twenty import/export formats. Flexibility of this caliber has made **form•Z** the most effective modeling complement to many popular animation programs.

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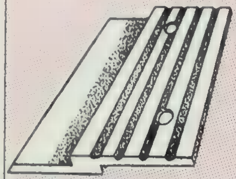

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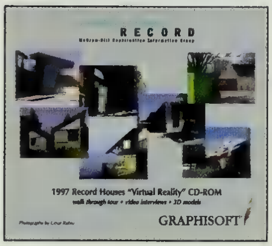

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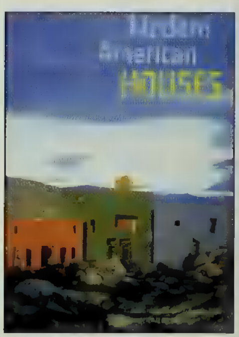

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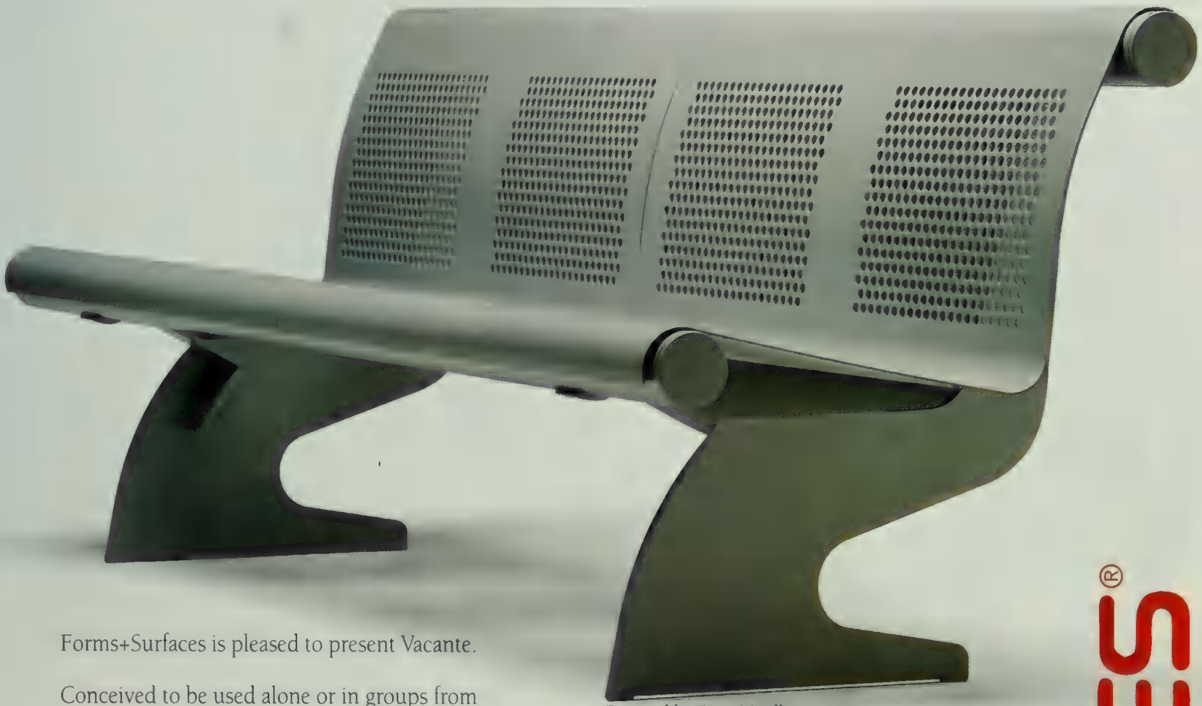

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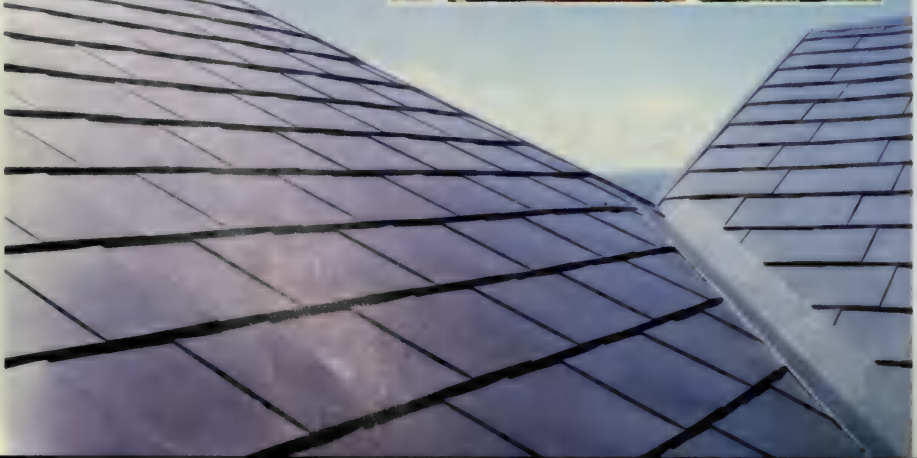

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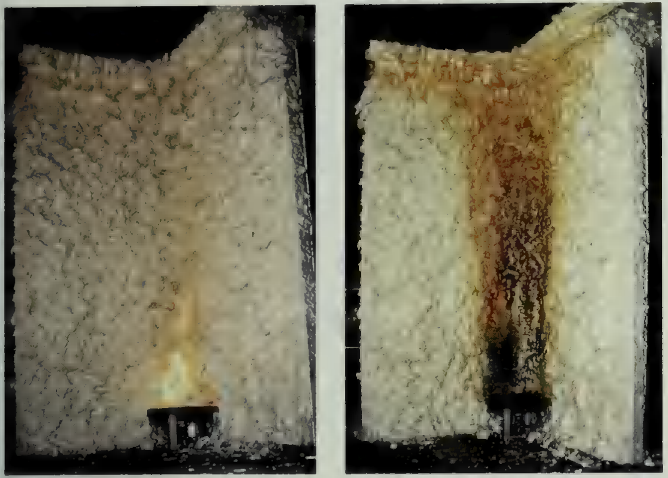
# NEW PRODUCTS

**On a recent trip to Orlando, I watched a fire level a forest in minutes from my hotel window. The fire was about 200 yards away, but I could smell the smoke and feel the heat. It prompted me to ask some of the hotel staff what built-in precautions there were in the guest rooms and shared areas. "Sprinklers" was the only answer I got. It goes without saying that fire safety in both commercial and residential construction is of the utmost importance. However, with the ever-changing codes, regulations, and technology, it's hard to keep up. ARCHITECTURAL RECORD is here to help.** ***Elana H. Frankel, Products Editor***



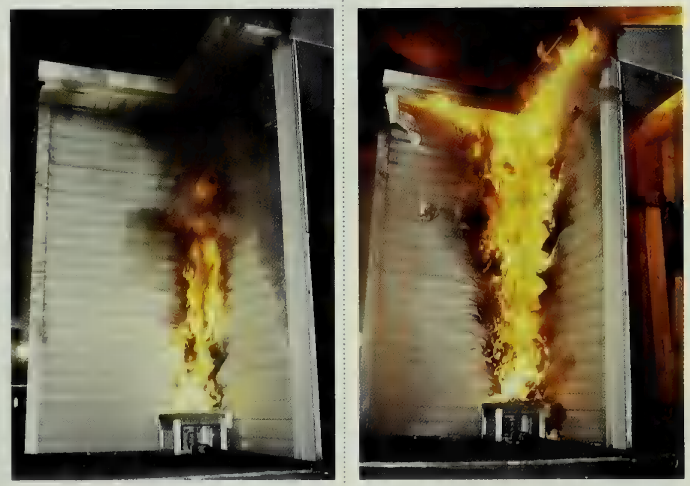
## THE FUTURE OF FIRE SAFETY AND BUILDING PROTECTION

The National Institute of Standards and Technology (NIST), based in Gaithersburg, Maryland, is in the process of developing a number of new fire-safety products, including foam fire suppressants to protect a building's exterior and "smart" fire alarm panels.

Dan Madrzykowski, a fire protection engineer at the NIST's Building and Fire Research Laboratory, is working with a variety of foam fire suppressants. According to Madrzykowski, one of the most exciting experiments his team recently performed was with a durable agent, a biodegradable protein-based compressed-air foam that protects a building's exterior from igniting.

To demonstrate the effects of the foam fire suppressant, the NIST team took exterior wall sections made of vinyl siding over sheathing on wood framing and formed two corners. Corner A was treated with the sticky, protein-based foam (see before and after photos above), while corner B received no treatment (photos above right). One hour later, both corners were exposed to a 50KW fire for 10 minutes. Within three minutes, the untreated corner had ignited, with flames extending into the eaves and roof areas. Corner A did not ignite, and after 10 minutes, the foam was washed off, revealing only minor damage (photo below).

Madrzykowski explains that if a building next door or trees in a backyard were on fire, the foam fire suppressant could be applied to a house to protect it from burning embers or radiant heat. A hose could be used to apply the foam, or even a unit with plastic water tanks on wheels. The foam could also be applied through a hose line on a fire truck, if the truck were equipped with a compressed-air tank and pump to make the foam. Or, if the foam were mixed at a low ratio (approximately 1 percent), the fire department would have to carry only small amounts of it to mix with water.



**These photos document the experiment that Dan Madrzykowski and his team performed using foam fire suppressants to protect a building's exterior. The siding that was treated (left) sustained little damage.**

**Smart wall panels**

Walter Jones of the NIST's fire-safety engineering department is in the preliminary stages of working with the fire-detector industry to build an in-wall system that would discover a fire, pinpoint its location, and predict the short- and long-term effects of its growth and the spread of smoke.

Most high-rise buildings are equipped with an annunciator panel—a big box with a flat plane, approximately two by three feet, and rows of trouble lights that monitor and report a building's conditions. Jones's project would add a "smart sensing" capability to the annunciator so that the fire department could create an effective strategy to put out the fire. This "smartness" would come from Intel chips (the same kind found in home PCs) embedded in the annunciator, which would help create a real-time response system and show, for example, the amount of carbon monoxide in a space, or which doors should be avoided.

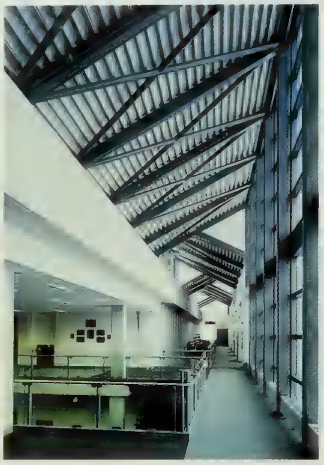
The final result, "a sort of cybernetic alarm," says Jones, would combine the NIST's fire-modeling software with the advanced sensors and annunciator. "In a large building," says Jones, "time is critical. The 'smart' wall would show what is happening [with the fire] and predict what will happen. It would have sensor data available and create a model environment that foresaw smoke spread."

Not surprisingly, Jones has been receiving calls from upscale home builders and developers around the country who want to install the fire-security panels, which are now under development. However, researchers will not have a working model of the system ready until the year 2002 and are still seeking industrial partners for the five-year project. 301/975-3058. NIST, Gaithersburg, Md.
**CIRCLE 200**

*For more information, circle item numbers on Reader Service Card*

## PROTECTING RESOURCES FROM FIRE AND DAMAGE

Fire is one of the most dramatic destructive forces to act on a building. An insurance company may reimburse for material loss in the aftermath of a fire, but it is the architect's and engineer's responsibility to think ahead to avoid human loss. These fire-safety products will help protect valuable human and material resources from draft, smoke, and flames.



### ▲ Decorative fireproofing

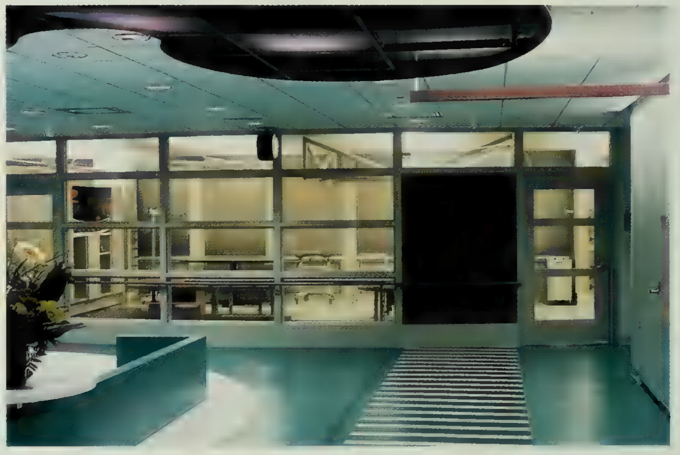
In the event of fire, A/D FireFilm II, an intumescent film for structural steel, softens and expands to form a meringue-like layer that insulates and protects the structure. The decorative topcoat, A/D Colorcoat, acts as a second protective layer. 800/263-4087. A/D Fire Protection Systems, Scarborough, Ont. **CIRCLE 203**

### ► Interior protection

The new M100 rolling fire door control system from Cornell Iron Works (shown) protects Benjamin West's painting *Christ Healing the Sick in the Temple*, which hangs in Philadelphia's Pennsylvania Hospital. The door measures approximately 18 feet wide by 21 feet high, and all of the controls and coils are recessed in an overhead soffit for a streamlined look. 800/233-8366. Cornell Iron Works, Mountaintop, Pa. **CIRCLE 201**

### ▼ Fire-rated glass ceramic

FireLite Plus, the impact-safety-rated version of the wireless fire-rated glass ceramic FireLite from Technical Glass Product (TGP), now meets the impact requirements of ANSI Z97.1 and CPSC 16CFR1201 Category II (400 fpi). TGP has also recently released a new four-page brochure on fire-rated glazing that features full-color installation photography, product descriptions, and specifications. Six of TGP's products are featured, including FireLite, FireLite Plus, FireLite NT, FireLite IGU, Pyrostop, and Pyroswiss. 800/426-0279. Technical Glass Product, Kirkland, Wash. **CIRCLE 204**

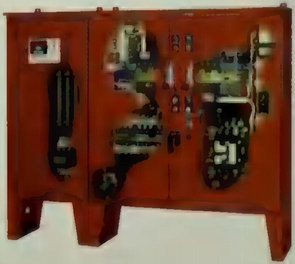


### ▼ Glazing for larger vision lights

Pemko's FG3000 glazing compound has been UL 10B tested and approved to allow for much larger lights in 20-, 45-, and 90-minute-rated doors and screens. For 90-minute hollow metal door applications, previous codes restricted wire-glass vision lights to 100 square inches. With FG3000, vision lights can be as large as 12 by 46 inches (multiple lights are allowed, but their combined total visible glass must not exceed 2,208 square inches). This is an increase of more than 2,000 percent. 805/642-2600. Pemko, Ventura, Calif. **CIRCLE 202**

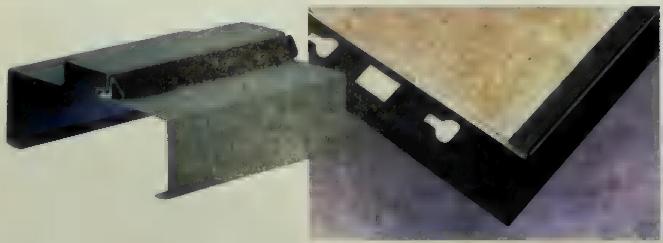
### ▼ Digital data display

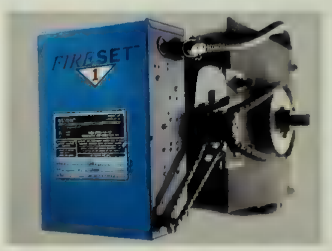
The Firetrol D$^3$ATA (Digital Data Display Acquisition and Time Analysis) System monitors and displays fire-pump system information and provides access to historical data and events. The D$^3$ATA is available as a modification to all Firetrol full-service electric pump controllers (600 VAC MAX) and includes the D$^3$ATA display, FTA470 pressure monitor, and printer-recorder. At the heart of the D$^3$ATA system is the FTA437 power monitor, which measures and records RMS motor voltage and current. 919/460-5200. Firetrol, Cary, N.C. **CIRCLE 207**



### ▼ Draft and smoke control

Ceco Door Products' Smoke Tech doors are made of either 18- or 16-gauge cold-rolled steel and feature an effective smoke seal that is fire-rated (NFPA-compliant). The flush or embossed panel doors are available as heavy-duty or extra-heavy-duty with sidelights, transoms, frames, and windows. Ceco Door Products' Fuego Fire Door satisfies NFPA-80 recommendations for vertical egress and has a solid mineral fiber core that can withstand 250-degree maximum temperature rise. Standard to extra-heavy-duty models in sizes up to 4090 single and 8090 pair are available. 615/661-5030. Ceco Door Products, Brentwood, Tenn. **CIRCLE 205**





### ▲ Fire door protection

Instead of having to manually reset an Atlas Door fire door, the Fireset 1 motor operator will automatically reset it by pushing the Open button. The UL-rated and FM-approved motor is designed for 22-gauge fire doors of up to 275 square feet in size. 888/553-5445. Clopay Building Products, Cincinnati. **CIRCLE 206**

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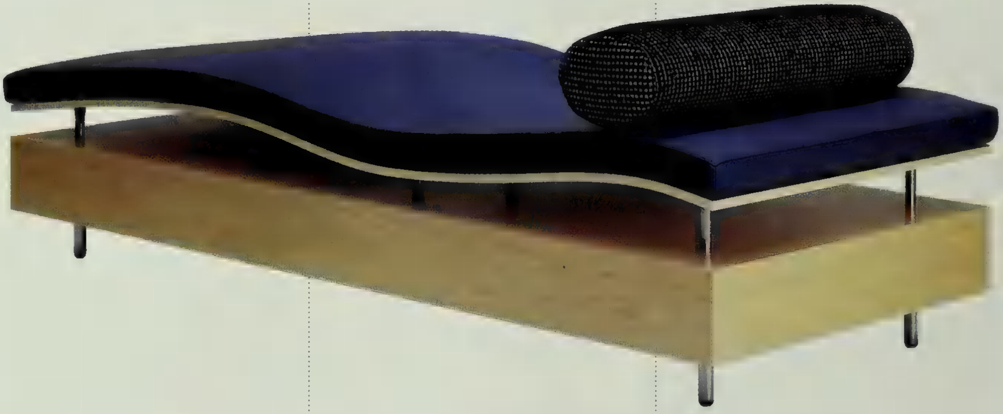
## ARCHITECT MAYA LIN CREATES HER FIRST LINE OF FURNITURE FOR KNOLL

To celebrate Knoll's 60th anniversary, the company commissioned Maya Lin to create a line of furniture that honors its design philosophy and tradition. Ten months of "a great shared experience," says Lin, resulted in furniture that is the product of an obvious love of architecture and design and a sculptor's eye for how forms and details interact with their surroundings. The Maya Lin Collection (subtitled "the earth is not flat") was inspired, she says, by her recent honeymoon in New Zealand and the South Pacific, her new life as a wife and mother, and Florence Knoll's legacy. Lin also researched the project by reading books on furniture and chair design. "The chair is the hardest to design," she says. "It is ultimately a self-portrait of who you are: what you would look like as a chair."

The first pieces Lin designed, called Stones (opposite right), are for both indoor and outdoor use, and Lin jokingly refers to them as the Honeymoon Suite. The group of hollow, lightweight fiberglass-reinforced cement elliptical stools with slightly concave seats (available in adult and children's sizes) and coffee tables with slightly convex tops are reminiscent of the pre-Columbian stones her husband collects, Lin says. "And they look like people sitting around a fire," she adds. "They are also a bit inspired by Brancusi." The muted earth tones—slate gray, gray-blue, pale green, pale yellow, and terra-cotta—are reminiscent of an exotic landscape, says Lin, and the curves echo the earth's horizon line. "On my honeymoon, I spent a lot of time looking out at the ocean and trying to see and understand the earth's curve," she says. Eventually



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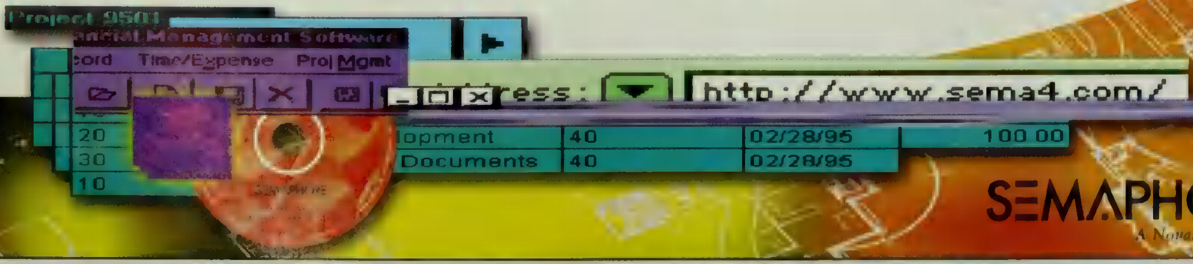

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CIRCLE 74 ON INQUIRY CARD

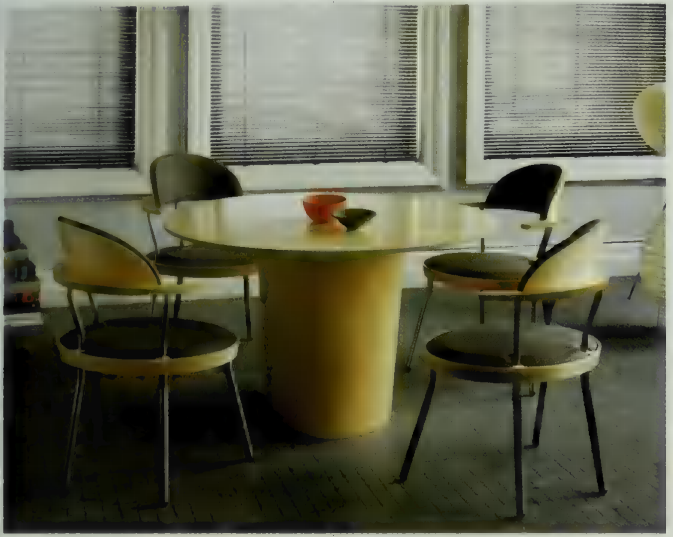
she captured it in the furniture.

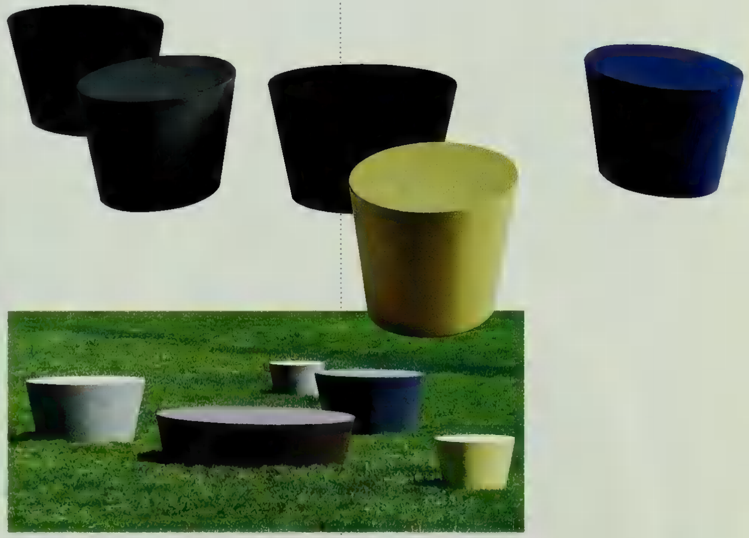
The next piece she developed, a maple-plywood chaise longue, "throws a curve ball at Mies," says Lin, referring to Mies van der Rohe's Barcelona sofa, which is currently manufactured by Knoll. For Longitude, Lin's updated interpretation of this contemporary classic, she floated a piece of curved maple plywood on metal supports above a maple plinth mounted on steel legs. The base is covered with a rectangular pad, available in leather or fabric, and comes with a bolster.

The last part of the collection is a maple dining table (Equator) and a set of maple chairs (30° East/30° West/0°), which further explore the flow of arcs and curves. The table is available in two sizes, and with three round and two oval tops, all convex. Because of the table's unusual design, the base, a cylinder of wood, appears to rotate and looks different from every angle.

The collection, says Lin, is not art furniture. "It's not about custom design for clients," she states. "It's for the masses." Remember, she adds, "I'm just a kid from Ohio." 215/679-4171. Knoll, East Greenville, Pa. **CIRCLE 208**

*For more information, circle item numbers on Reader Service Card*





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# HOT TOPICS

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Fire-Rated Glazing News From
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**www.fireglass.com**

# Avoiding Liability:

## Making Wise Choices in Fire-Rated Glass

In today's world, not all fire-rated glass is created equal. There are different levels of listings, and even occasional disclaimers. How can you be sure you have chosen the correct product?

While no system is fool-proof, there are ways to minimize the risk of a costly mistake. When you're reviewing product listings, here are some words and phrases that should serve as red flags:

### 60 minute rating WITHOUT HOSE STREAM

For glazing rated more than 20 minutes, UL-9 and UL-10B require products to pass the hose stream test. It is not optional. Products that carry a "provisional" listing with no hose stream test (such as SuperLite I XL) leave open the possibility that the glazing will fall out of the frame when hit by water from a sprinkler or fire hose.

### Ask yourself:

Will I be compromising life safety by allowing this product in this application?

f the wrong product is used and fails, an I be held responsible?

What is driving this product choice: ost considerations only or concern or fire and life safety?

### Directional product

This indicates the product only provides fire protection from one direction. Can you accurately predict on which side of the glass the fire will break out? If not, a one-sided product is inadequate and potentially dangerous.

### Conditional listing

Such a listing requires special "conditions" for a product to actually satisfy the listing. For example, some wired glass is now listed for use in very large sizes. But the listing hinges on the use of special glazing compounds that may be "forgotten" when the glass is actually installed.

### Active product

Some glazing systems require sprinklers in order to achieve a certain rating. If the sprinklers do not activate quickly or are improperly installed, the glass may not provide the desired fire protection.

It's always a good idea to check your selection with a reliable source before making a final decision. At TGP, we specialize in helping architects and glaziers find the right product -- even if it's not ours. Call 1-800-426-0279 for answers to your questions about fire-rated glass.

HOT TOPICS

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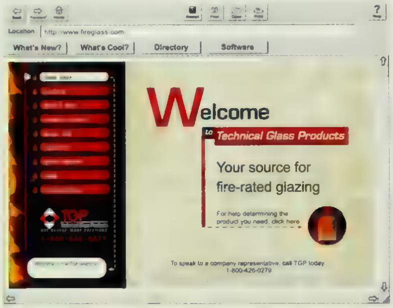
# Fireglass.com Heats Up The Internet

The new Web site for Technical Glass Products is up and running. Next time you log on to the Internet, check out fireglass.com for all your fire-rated glazing needs.

We've incorporated a number of helpful features, including complete product descriptions, on-line quote requests, and a product selection wizard to help you choose the right glass.



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---

### While you're surfing the net, here are some other sites of interest:

**Associations**
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CONSTRUCTION SPECIFICATIONS INSTITUTE - www.csinet.org
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Get instant access to fire-rated glazing information with the SpeciFIRE™. We've updated and enhanced our original SpeciFIRE, a comparison tool used by glaziers, architects and code officials to help evaluate fire-rated glazing options.

The latest version of the SpeciFIRE provides sizes, ratings and characteristics of six commonly specified fire-rated glazing products. It's an easy way to compare products side by side, and can serve as a quick guide for determining if a product is being used properly. The expanded version includes an extra panel of important questions to ask before specifying or approving fire-rated glazing.

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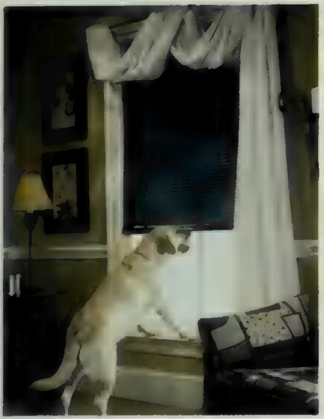
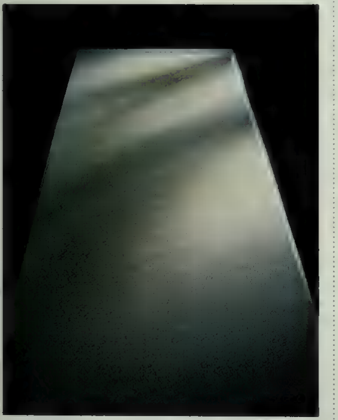
## PRODUCTBRIEFS



**▲ Safe and sound**

The Window Coverings Manufacturing Association recently awarded Levolor Home Fashions the Product Safety of the Year Award for its cordless blind—a child- and pet-safe design. Levolor also introduced the one-inch aluminum Mark I cordless blind, with a valance-free headrail design and concealed mounting system. Future Levolor products include a cordless cellular shade, to be introduced in late 1998, and a cordless wood blind, to be introduced in early 1999. 800/232-2028. Levolor Home Fashions, High Point, N.C. **CIRCLE 209**



**▲ Movable wall series**

The panel faces of Perceptions, Dowcraft's cutable floor-to-ceiling movable walls, are made of durable, lightweight substrate, making for a tackable wall surface. Wood veneer, vinyl, and fabric finishes are available. Built-in horizontal raceways provide for electronic data and communications. 800/990-9255. Dowcraft, Falconer, N.Y. **CIRCLE 214**

**▼ Safety flooring**

AltroSmooth Concorde vinyl flooring (shown) is available in a variety of colors, as are Stronghold 30 and Walkway 20/20SD, slip-resistant sheet vinyl. All are made with Easyclean. 800/565-4658. Altro, Mississauga, Ont. **CIRCLE 210**

**▲ The dishwasher files**

Drawers in household appliances are all the rage, and the buzz among magazine editors at April's Kitchen and Bath Industry Show in Chicago was the DishDrawer from New Zealand's Fisher and Paykel. Though the company has been manufacturing major appliances Down Under since 1934, they did not enter the American market until 1996, when they introduced a washer and dryer system. Their latest introduction is a dishwasher system that can be installed as a one- or two-drawer unit and uses only 2.4 gallons of water per drawer load. Eight wash cycles run very quietly, and a flow-through dispenser dilutes the detergent during the wash cycle. The front panel, available in stainless steel, white, and black, can also be matched to cabinets. 714/829-8865. Fisher and Paykel, Laguna Hills, Calif. **CIRCLE 211**

**► Spiral stair kit**

Until this past April, Albini and Fontanot's indoor and outdoor spiral staircases were not readily available in the United States. But now architects and designers can specify and easily obtain any of the Italian company's three models: the Phoenix (shown), an indoor model with laminated birch plywood treads and metal parts finished in epoxy resin; the Civik, a more contemporary design with steel treads covered with slip-resistant rubber overlays; and the Civik Zink, an outdoor stainless-steel model that is heat-galvanized to protect against rust. All three models are available in dimensions that meet BOCA and UBA codes. 888/STAIRKT. Albini and Fontanot, Needham, Mass. **CIRCLE 212**

**▼ Crank it up**

Jenn-Air's new line of fully loaded Cook's refrigerators offers several perks for the seriously kitchen-minded, including an ice and water filtration system and separate temperature controls for the freezer and refrigerator. The coolest feature of these refrigerators, however, has to be the elevator shelf, which can be raised, lowered, or removed with a quick turn of a handle. 800/JENN-AIR. Jenn-Air, Newton, Iowa. **CIRCLE 213**

**◄ Networked home**

IBM's Home Director Professional includes a central controller; a network connectivity device to control lights and appliances from a TV, wall switch, or computer program (shown); and operating software. It allows homeowners to monitor and control home systems via the Internet and will integrate with standard Category 5 wiring and RG6 coaxial cabling. 800/426-7235 x4340. IBM, Somers, N.Y. **CIRCLE 215**

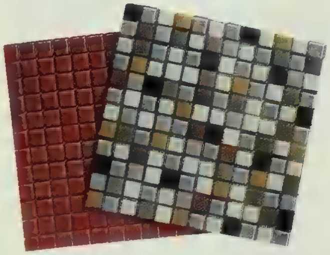
## PRODUCT BRIEFS

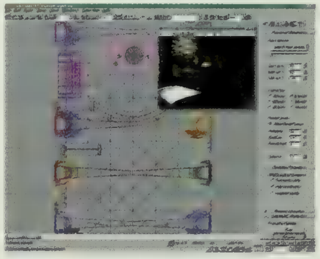
### ► Building product collection

The Designer Accessories collection of building products from Alcoa includes door surrounds, window mantels, detail molding, shutters, wainscot, dryer vents, fixture mounts, gasable vents, corner posts, Accent Panel fishscale in four patterns, and aluminum soffits (shown). 800/962-6973. Alcoa, Peoria, Ill. **CIRCLE 216**

### ▼ Tile trend

Mosaic tiles have made a comeback, and the Canadian company Interstyle recently debuted their latest entry, called Glassblends. The mesh-mounted, matte and glossy glass mosaic tile shown here is in the color Earthtones; the solid-color mosaic tile, called Klee Rose, is from the Painter's Palette collection. 604/421-7229. Interstyle, Burnaby, Vancouver, B.C. **CIRCLE 218**





### ▲ Future modeling potential

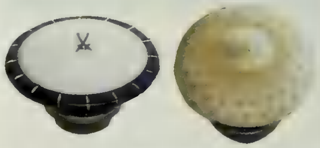
Used in conjunction with 3D animation software products like 3D Studio MAX and 3D Studio VIZ, Lucidity RT software creates interactive video navigation for 3D models in MPEG1 and MPEG2 (MPEG2 is the digital video standard for DVD, DVB, DSS, and Windows 98). 650/655-4820. Digital Media Interactive, San Mateo, Calif. **CIRCLE 219**

### ▲ It's a data thing

To work in conjunction with Haworth furniture and, in particular, the company's Causeway spine wall, Haworth and Krone (a Colorado-based network design company) designed the latest in panel-to-panel cabling. In order to accommodate a work space that constantly needs reconfiguring, the DataThing system has three parts: in-feeds that connect furniture cabling to the building's cabling; a communications distribution assembly (CDA) that snaps voice and data cable together; and an outlet tap that provides access points for phones, computers, fax machines, and the like. The cabling system is distributed by Anixter, an Illinois-based network and cabling company. 800/344-2600. Haworth, Holland, Mich. **CIRCLE 221**

### ▼ Bathroom check

Thanks to the partnership between American Standard and Corian, Corian's solid surfacing material is now available as a shower or bath wall. Corian walls do not need grouting, are stain-resistant, and prohibit mold and bacteria growth because of their nonporous nature. The walls are available in three installation shapes—alcove, corner, or bathtub—and in the color Glacier white, with three patterns to choose from. 800/524-9797 x199. American Standard, Piscataway, N.J. **CIRCLE 217**

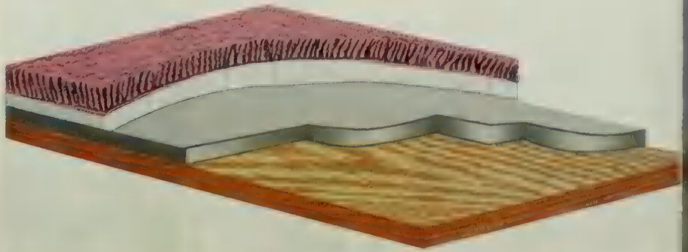


### ▲ Fine porcelain features

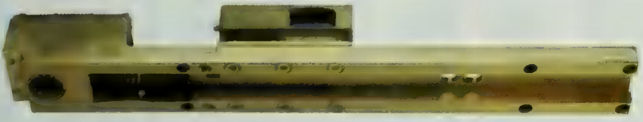
Dornbracht's Belle de Jour collection includes star-shaped porcelain handles from Sieger Design with chrome fixtures; cream-white Murano glass handles with inset gold particles from Italian glass-blowing company Venini (above right); and porcelain handles with handpainted swords in cobalt blue and decorative trimming in gold from Meissen (above left). The collection comes in single- or three-hole lavatory fittings and a single-lever mixer. 800/774-1181. Dornbracht, Duluth, Ga. **CIRCLE 220**

### ▼ Sound deadening

Used as an alternative to concrete, Homasote 440 Sound Barrier floor and ceiling systems control noise in commercial and residential construction. The tight, lightweight, permanent boards are the thinnest profile possible for highly effective sound deadening and are designed for use with carpet and pad, laminate floors, or other surface treatments. As shown in the illustration below, a half-inch Homasote 440 board (the gray layer) lies underneath the carpet (pink) and pad (white) but above the plywood (brown). Homasote 440 boards will not crack or dust up. New literature describing floor and ceiling assemblies with STC (sound transmission class) and IIC (impact insulation class) is also available. Results of STC-55 and IIC-82 (as determined in tests performed in a facility certified by NVLAP) are easily obtainable in conventional construction using Homasote 440 Sound Barrier boards. 800/257-9491. Homasote, West Trenton, N.J. **CIRCLE 222**



# Ellison's Balanced Door. Greater Than The Sum Of Its Parts.


*Cast bronze check and door guide assembly*

+

*Cast bronze top pivot with bearing*

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*Torsion bar closer spring*

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*Cast bronze bottom arm*

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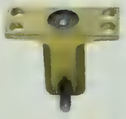
*Cast bronze semi-automatic hold open device*

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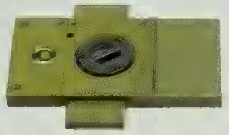
*Cast bronze floor box*

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*Cast bronze door roller guide*

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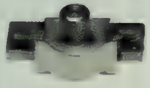
*Cast bronze door bottom pivot*

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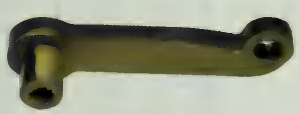
*Cast bronze top arm*

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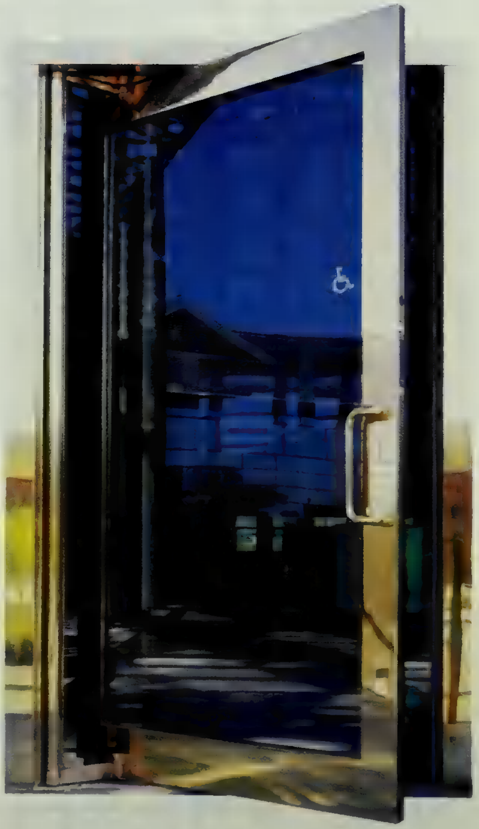

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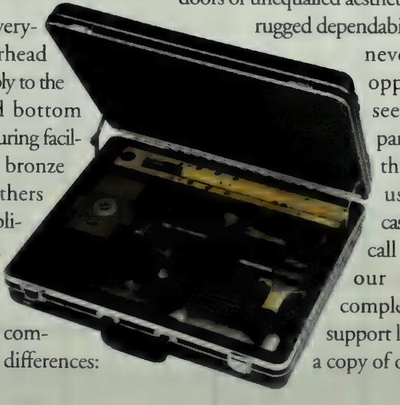

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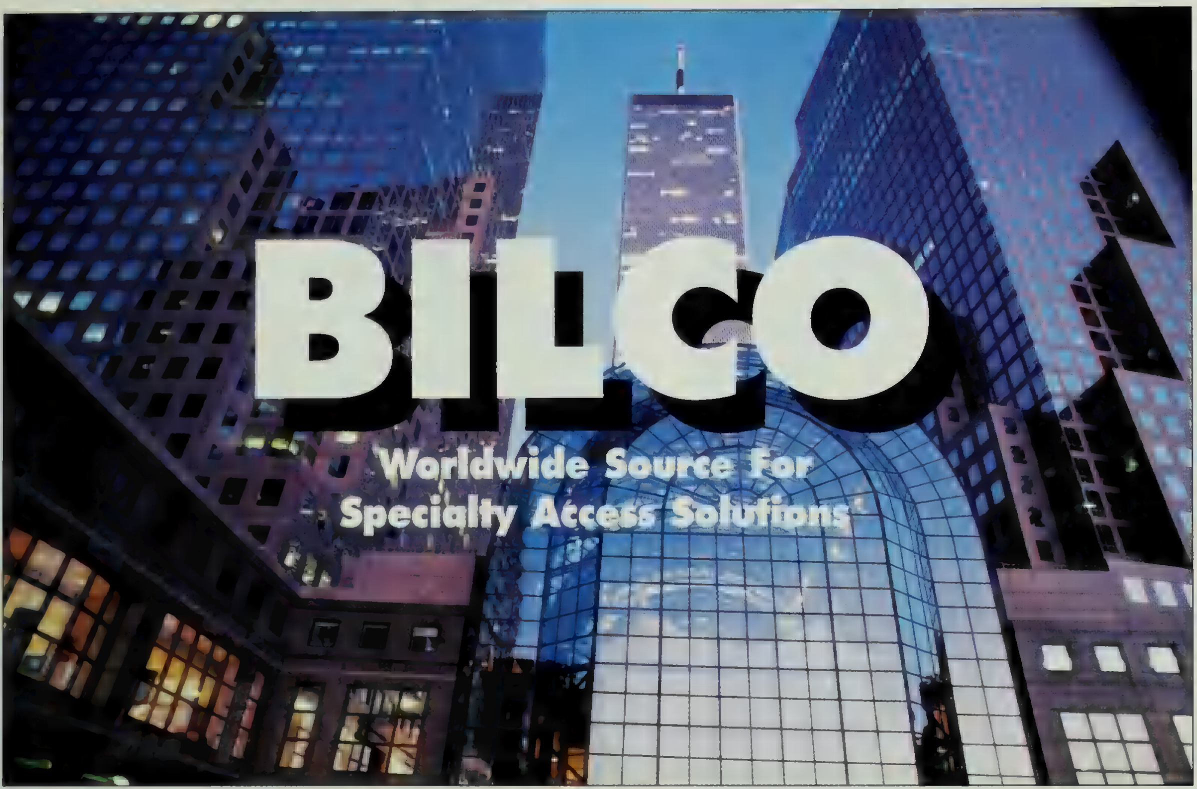

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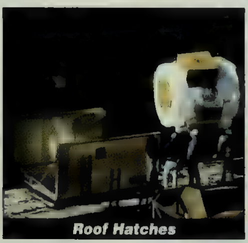
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## PRODUCTLITERATURE

**Watertight wall**

Dryvit's three-layer Infinity wall system is a pressure-equalized rainscreen that is engineered to prevent water infiltration. The new brochure highlights its benefits and use in projects around the country. 800/556-7752. Dryvit, West Warwick, R.I. CIRCLE 223

**Steel innovations**

Five newly designed brochures describe steel use in roofing and facades; passenger stations; older buildings; shopping centers; and residential construction. 202/452-7100. American Iron and Steel Institute, Washington, D.C. CIRCLE 224

**Coordinating fabrics**

The new Sunbrella brochure shows awning and canopy fabrics and coordinating furniture fabrics. 336/227-6211. Sunbrella, Glen Raven, N.C. CIRCLE 225

**Vinyl siding**

The Vinyl Siding Institute released a list of more than 200 products, manufactured by 15 companies, that have been independently verified to meet or exceed ASTM D3679, the national standard for quality. 888/FOR-VSI1. Vinyl Siding Institute, Washington. D.C. CIRCLE 226

**Solid brass accessories**

A new Omnia brochure focuses on brass bathroom accessories. 973/239-7272. Omnia, Cedar Grove, N.J. CIRCLE 227

**Eco-responsible concrete**

The Environmental Life-Cycle Assessment brochure evaluates concrete's environmental impact. 800/994-ECCO. Environmental Council of Concrete Organizations. Skokie, Ill. CIRCLE 228

**Bathroom enclosures**

Metapar's new CD-ROM contains specifications, colors, cuts, and technical product information on toilet, dressing, and shower enclosures. 516/333-2600. Metapar, Westbury, N.Y. CIRCLE 229

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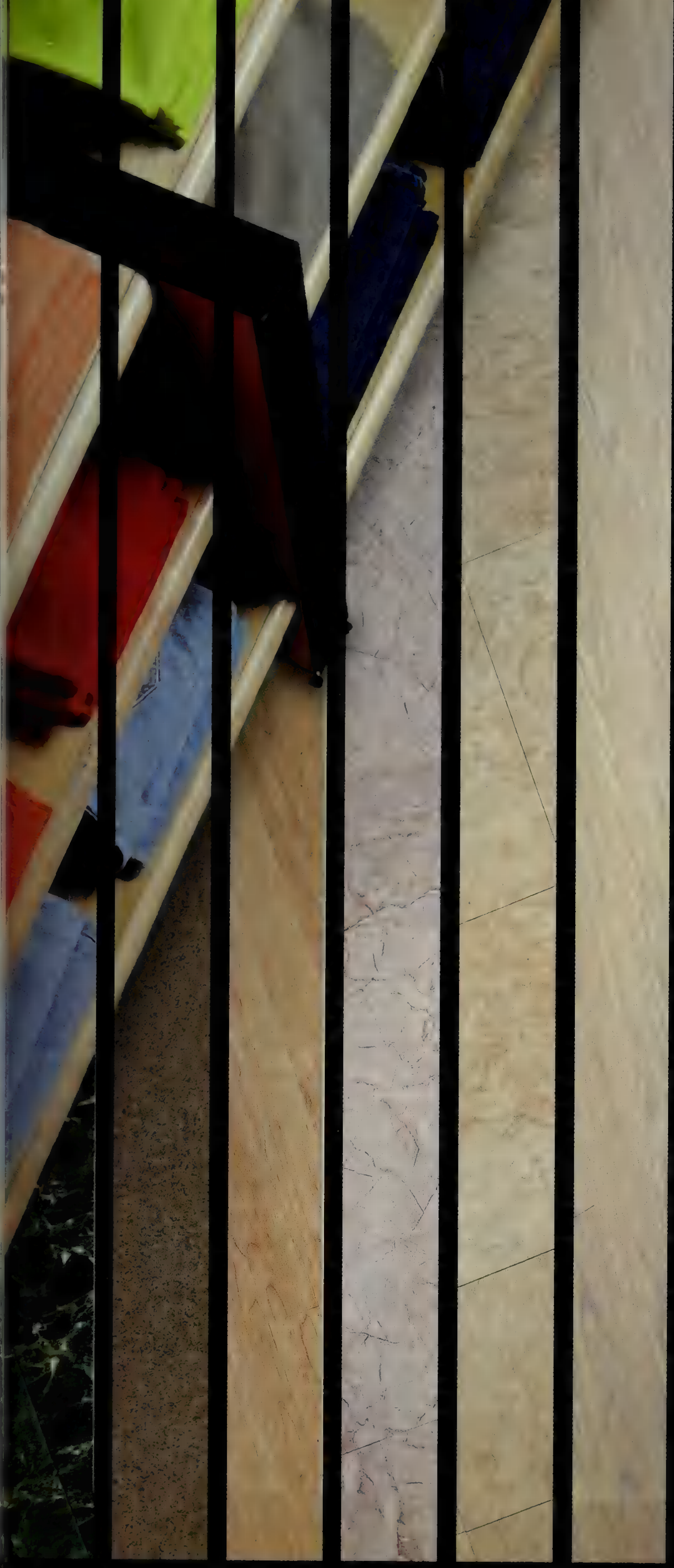

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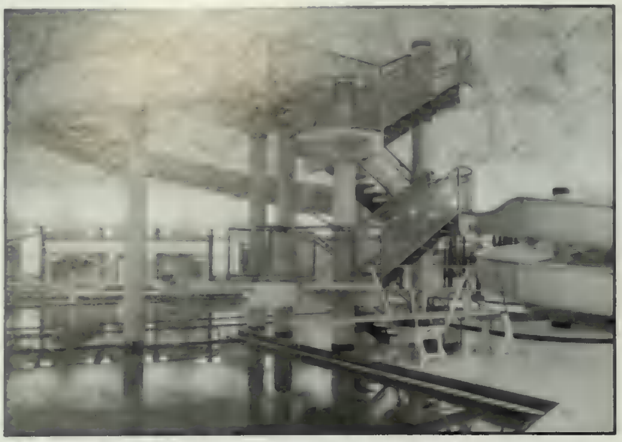

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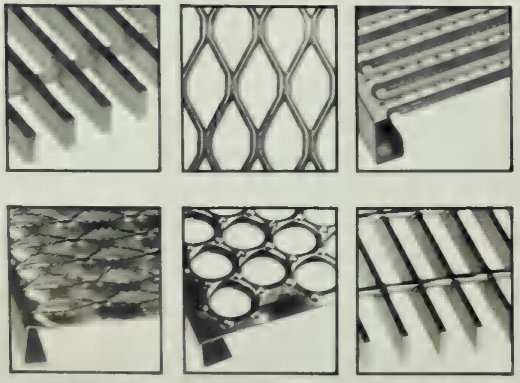

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## PRODUCT LITERATURE

### Multimedia design

Kolbe & Kolbe's Interactive Design System (KIDS) on CD-ROM presents various window options. KIDS answers questions about jamb size, type of glass, and exterior finish, and displays drawings of the specified windows. 800/955-8177. Kolbe & Kolbe, Wausau, Wis. **CIRCLE 230**

### Composite panels

The Composite Panel Association (CPA) has published three new technical bulletins on medium-density fiberboard moldings, particleboard for stepping, and particleboard underlayment. 301/670-0604. Gaithersburg, Md. **CIRCLE 231**

### Lighting lines

Irideon's brochure highlights two new products—the AR6 recessed spot luminaire and the AR7 recessed wash luminaire. Both products provide automated beam movement, shaping, color changing, and pattern projection. 800/255-1727. Irideon, Dallas. **CIRCLE 232**

### Stone products

See and select cultured stone products with StoneCAD version 1.1, a CD-ROM by Stone Products. The latest enhancement is the AutoCAD hatch pattern installer tool called StonePAT. 707/255-1727. Stone Products, Napa, Calif. **CIRCLE 233**

### Seismic handbook

The Portland Cement Association's (PCA) handbook on the design of low-rise concrete buildings for earthquake forces provides an analysis of such structures according to the 1996 BOCA National Building Code and the 1997 edition of the Standard Building Code. 800/868-6733. PCA, Skokie, Ill. **CIRCLE 234**

### Gypsum board

The Gypsum Association's brochure provides architects with ideas for using gypsum board in construction. Photos feature projects that were the winners or honorable mentions in the association's recent design and construction program. 202/289-5440. Gypsum Association, Washington, D.C. **CIRCLE 235**

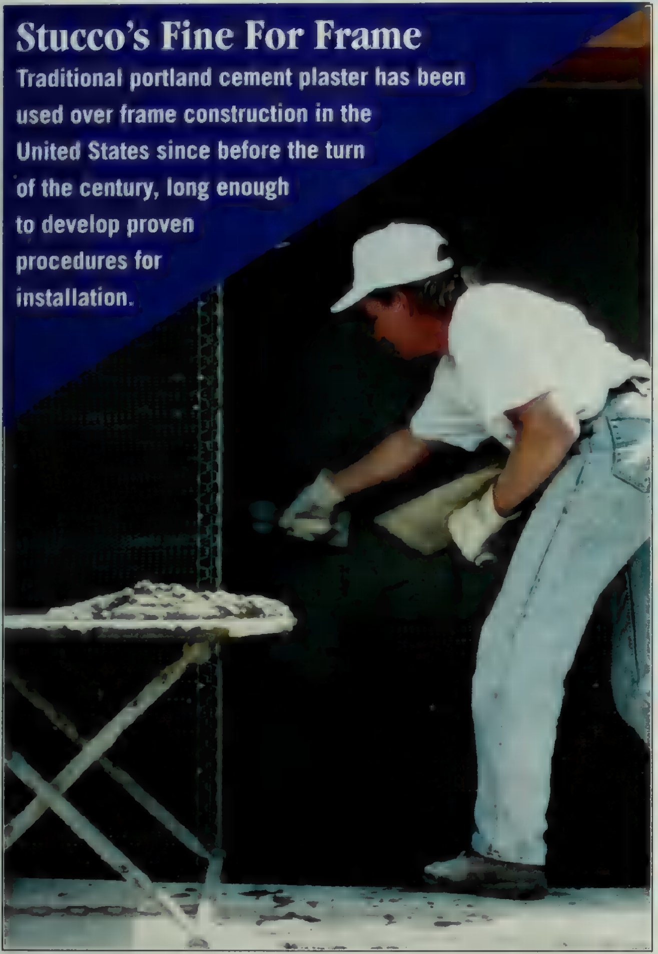
### Sweet's CD-ROM

SweetSource is a product selection and specification tool that provides AEC professionals with the Sweet's catalog files in electronic format. 800/227-0038. Sweet's, New York City. **CIRCLE 236**

### Fire code on disc

Intermedia Design Systems (IDS) has new and updated software called autoBOOK: NYS Uniform Fire Prevention and Building Code. 800/288-5453. IDS, Latham, N.Y. **CIRCLE 237**

# IT'S TIME TO RETHINK STUCCO



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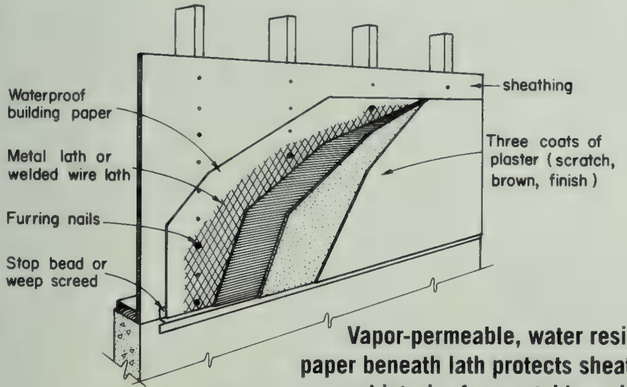

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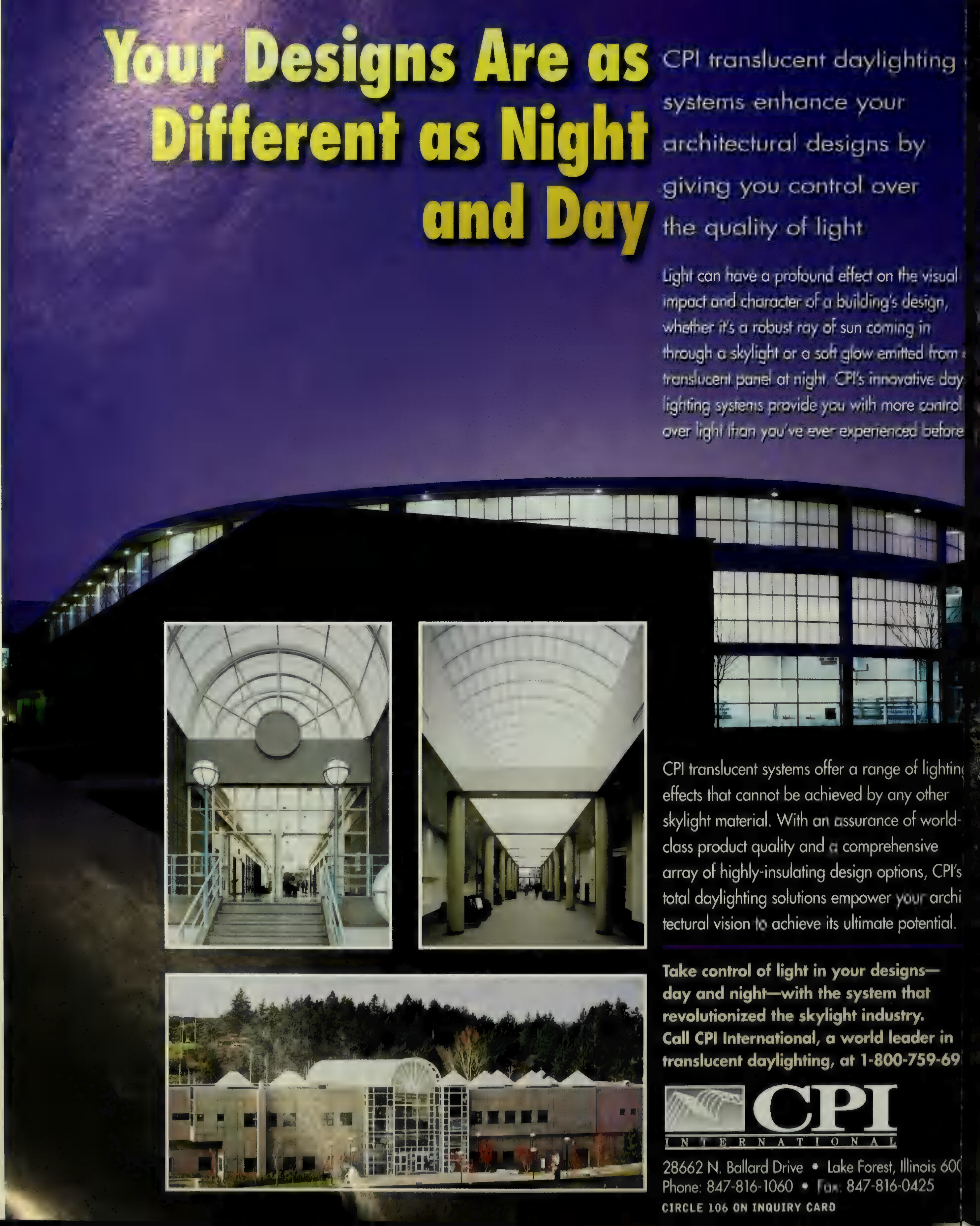

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Though the reputation of Girard College and its alumni is widespread, less is known of the extraordinary story behind the design and construction of its first buildings.

The competition for the architectural commission to plan Girard College attracted the most accomplished architects of the day. One hundred and seventy drawings were displayed in Independence Hall and the winner was Philadelphia Architect Thomas U. Walter, who later went on to complete work on the United States Capitol.

After the College opened in 1848, more than 200 of the competition drawings were placed in the third floor of Founder's Hall, where they remained undisturbed, unnoticed and unappreciated for more than a century.

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(continued from page 56)

architecture and ABET member schools of architectural engineering in the United States, Canada, and Puerto Rico are asked to investigate, measure, evaluate, and report on the performance of existing buildings. For information, write Gail Brager, Vital Signs, UC Berkeley, Berkeley, Calif. 94720; E-mail vitalsigns@ced.berkeley.edu; or visit www.ced.berkeley.edu/cedr/vs/act/act_main.html.

**Religious Art and Architecture Design Awards**
*Registration deadline: June 19; submission deadline: July 24*
*Faith & Form* magazine and the Interfaith Forum on Religion, Art, and Architecture are sponsoring three competitions under the categories of religious architecture, liturgical/interior design, and religious arts. Projects must have been completed since January 1, 1993. Contact *Faith & Form* at 919/489-3359 for an entry form.

**Urban Studies and Architecture Institute Competitions**
*Registration deadline: June 25; submission deadline: July 1*
Two ideas competitions—one for the proposed redesign of a neighborhood in Verona, Italy, and one for the proposed creation of artificial islands in New York—offer $3,000 prizes and $12,000 grants. Call 212/727-2157 for details or E-mail Ldusainst@aol.com.

**Gold Key Awards for Excellence in Hospitality Design**
*Submission deadline: July 1*
Categories for submissions include small and large restaurants, lobbies, guest rooms, suites, and senior living facilities. Entries must represent projects constructed or completed between January 1, 1997, and June 1, 1998. For an entry form, call Ron Zobel at 914/421-3315.

**Youth Salon Competition**
*Submission deadline: August 4*
Architects and artists under 35 years old are eligible for this ideas competition. The challenge is to identify a problem in one's city, solve it with design, and evaluate the solution. For entry requirements or more information, visit www.makoto-architect.com.

**James Marston Fitch Charitable Trust Mid-Career Grants**
*Application deadline: August 15*
Research grants of $20,000 are being awarded to professionals in the fields of historic preservation, architecture, landscape architecture, urban design, environmental planning, archaeology, architectural history, and the decorative arts. Those who have an advanced or professional degree and at least 10 years of experience are eligible. Smaller grants of up to $10,000 are also being awarded. Contact Morley Bland at Beyer Blinder Belle, 212/777-7800, for more information.

**Pier 40 Competition**
*Registration deadline: August 17; submission deadline: September 17*
The Van Alen Institute and a local community board are sponsoring a design competition for a 15-acre pier on New York City's Hudson River waterfront. The pier is at the center of proposals to turn the entire waterfront into green space. Visit www.vanalen.org for details.

**Boston Society of Architects Design Awards**
*Submission deadline: August (unbuilt awards); September (honor awards)*
The BSA's Architectural Design Honor Awards program is open to all Massachusetts architects' projects anywhere in the world and to all architects who have designed built projects in Massachusetts. The Unbuilt Architecture Design Awards are open to architects, architectural educators, and students anywhere in the world. Call BSA at 617/951-1433 x221; fax 617/951-0845; or E-mail bsarch@architects.org.

**Membrane Design Competition**
*Submission deadline: September 2*
This year's Membrane Design Competition, sponsored by Taiyokyogo Corporation, honors the creative design of airport structures using membrane. Write Membrane Design Competition, 4-8-4 Kigawa-higashi, Yodogawa-ku, Osaka 532-0012, Japan; fax 011/81-6-306-3154; or E-mail mh_001600@fc.taiyokogyo.co.jp.

**Shinkenchiku Residential Competition**
*Submission deadline: September 10*
Kyoto architect Shin Takamatsu will judge this year's ideas competition, sponsored by *Japan Architect* magazine. Winners' work will be published in the December 1998 issue of *JA*. To receive a copy of the rules, fax a request to 011/81-3-3811-0243.

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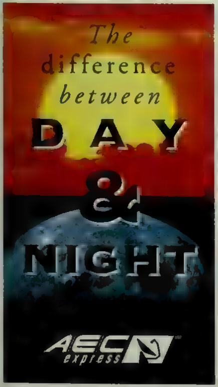
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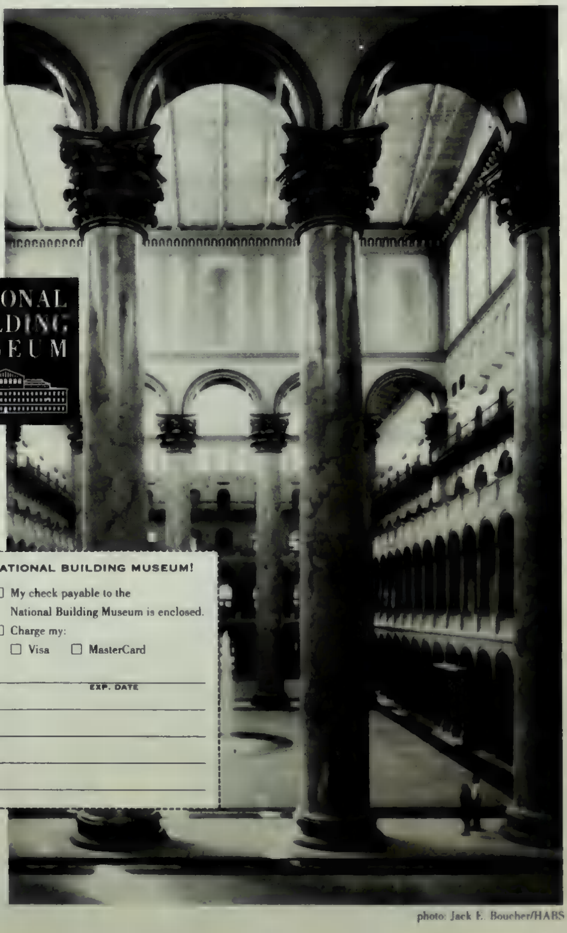

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**URBAN VIBE** *continued from page 71*

these buildings have positive architectural qualities. The reasons offered for retention are either practical (whether it is the crude Viennese argument or a more subtle appeal to the ethic of recycling and reuse) or didactic. History, of course, is always written by the victors, but every historian makes choices. As discussions like these make clear, the past is one of the most useful tools for controlling, even banishing, the past. By reducing the character of pastness to a bit of shrivelled aura evoked by a narrow range of closely controlled, decorative signifiers, the past is captured from itself: this is the Disneyland effect. In this sense, historicist architecture carries on the task of modernity far more succinctly than modernity itself.

If the past cannot be distinguished as being inhabited by anything but "pastness," our fantasies surely can be. Fantasies can be judged. There are good and bad fantasies, and all embody someone's desires. Every monument is also a monument to the desire to remember. Such collective fantasies always presume their own flip side: a consensus of fear. The *flakturm* stand because the Viennese have insufficient anxiety about the Nazis and thus see their artifacts as harmless. Not seeing themselves as opponents or victims, they have no reason to dread the victimizer.

The town where I grew up had, near its main intersection, a statue of a Confederate soldier, leaning on his rifle, looking south. This monument was not simply about acknowledgment, it was about celebration—the emblem of the town. But who was celebrating what? However many football games it waves over, the Confederate flag is still the emblem of a racist culture. But it's only such a symbol to those who revile racism, and only until that meaning is lost or buried, only until the stars and bars finally become just another logo. We manage such transformations and we must do so with care.

Like fear, vibe is a cultural construct. The neutrality of the environment is a myth. Every place—knowable only through our reading of it—produces a vibe, or what used to be called a *genius loci*. But reading offers the promise of difference. Amsterdam is delightful to me both because I find the Dutch congenial and because the spaces and architecture there interact beautifully with values I see as continuous with this congeniality: openness, informality, intimacy, sensuality. But my sense of this comprehensive congeniality would probably not be so appealing to Jesse Helms or the Ayatollah. Vibe always raises the question of relativism, and relativism always risks evading the ethics of the situation.

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Consumer culture creates empty differences, and this lack of meaningful distinction frustrates consent, which cannot genuinely be given without real choice. The legibility of vibe is further complicated because different groups (and individuals) reach different forms of consensus about the meanings of different signifiers. The gated community has very different meanings for those within and without, and the *flakturm* seem sinister only to those who revile their builders. And this is why monuments—and architecture—are so important to vibe: they fix our desires where everyone can see them. ■

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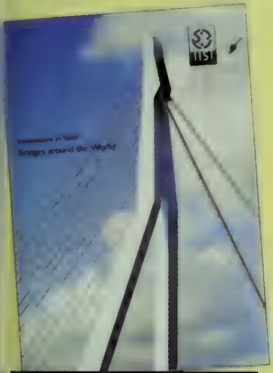

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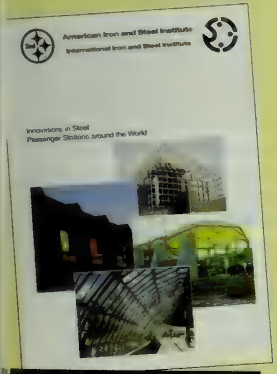

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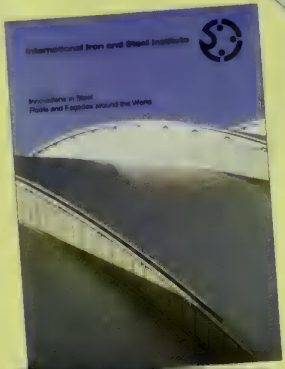

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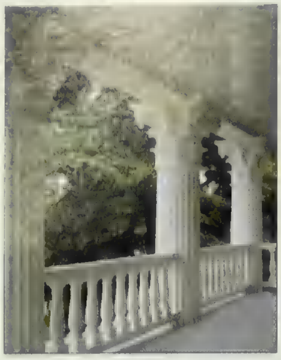

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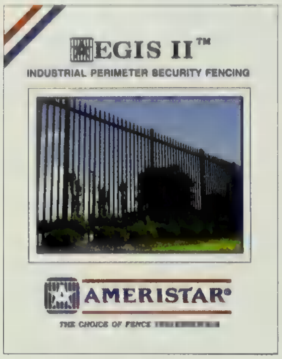

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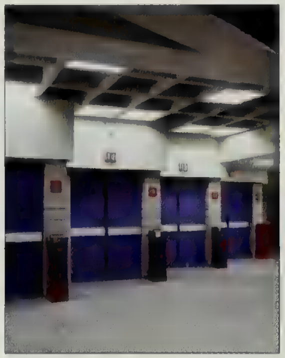

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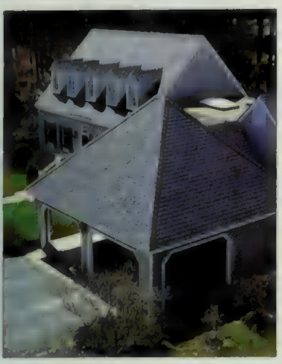

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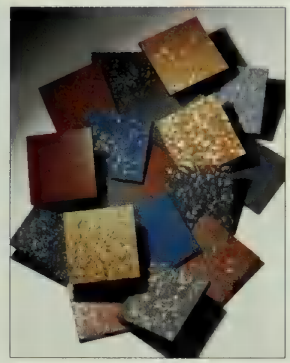

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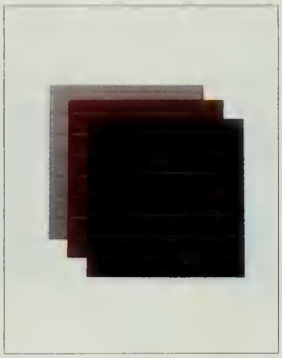

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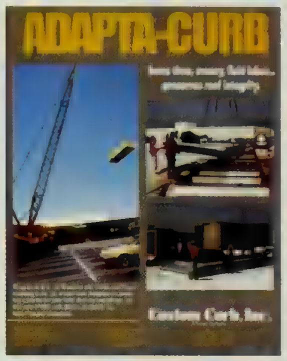

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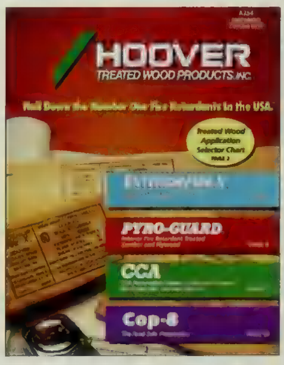
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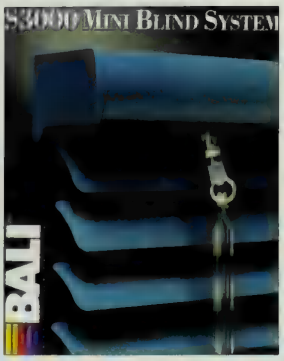

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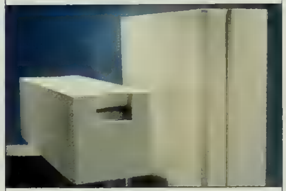

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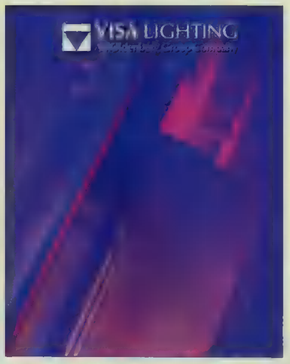
CIRCLE 140 ON INQUIRY CARD

### The 1998 Visa Magazine



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**Visa Lighting**

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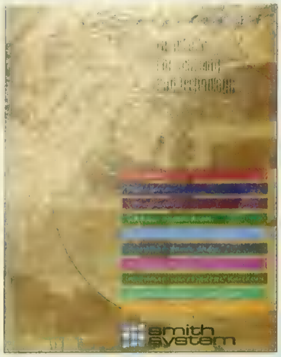

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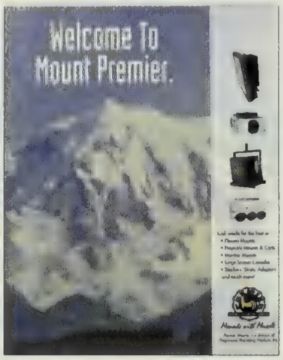
**Smith System**

CIRCLE 142 ON INQUIRY CARD

### Mount Catalog Covers Industry



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**Progressive Marketing**

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### Senergy's New Aurora Stone Finish

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**Senergy**

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**Dowcraft Corporation**

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**Mapes Industries, Inc**

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BASIN GUARD
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TRUEBRO

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**CENTRIA**

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**Ancor Granite**

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**Egan Visual Inc.**

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**Hadrian Inc.**

CIRCLE 152 ON INQUIRY CARD

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manufactures composite building panels in a variety of different face materials and finishes. Aluminum: two, three and four coat Kymar finishes, anodized, colour & brushed. Stainless Steel: 304, 316 grades, #4, #8 finish, coloured stainless and patterned. Zinc: Rheinzink preweathered. Porcelain: for Spandrel applications. Copper: prepatinated.

**Pan-Tech, Inc.**

CIRCLE 153 ON INQUIRY CARD

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**S+P Architectural**

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Application is required to be considered. Contact human resources department (904) 632-3210 days, and (904) 632-3160 evenings/weekend; e-mail address: employment@fccj.org. FCCJ is an equal access/equal opportunity/affirmative action college.

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# COLLEGE OF ENGINEERING & PETROLEUM

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- Visual Arts

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Application forms and Conditions of Service may be obtained from:

Embassy of the State of Kuwait
Kuwait University Office
3500 International Drive, NW
Washington, DC 20008
Tel: (202) 363-8055

Completed applications together with copies of diplomas, transcripts of all degrees obtained and a detailed resume indicating past experience and publications must all be returned directly to:

College of Engineering & Petroleum
Department of Architecture
Kuwait University
P.O. Box 5969 Safat
13060 KUWAIT

Fax: (965) 484-2897
Tel: (965) 481-9094

## OFFICIAL PROPOSAL

Virginia Tech 1872

VIRGINIA POLYTECHNIC INSTITUTE
AND STATE UNIVERSITY

**Architectural / Engineering Services** Request for Proposal #622560

Virginia Polytechnic Institute and State University (Virginia Tech) in Blacksburg, Virginia is seeking proposals from qualified firms to provide professional Architectural/ Engineering Services for the War Memorial Court and Chapel Restoration Project. The Chapel and Court were created in the 1950ís as a lasting memorial on the campus for those alumni who lost their lives in military service to their country. Its location is significant to Virginia Tech as a symbolic entry point to the campus center. The Architectural/Engineering firm shall have proven experience with: monument and sculpture conservation, lighting of exterior monuments, and terrace/roofing restoration.

The entire Request for Proposal # 622560 may be requested in writing by faxing (540) 231-9628. Proposals must be returned to Virginia Tech, Purchasing Dept., 144 Southgate Center, Blacksburg Virginia 24061, 3:00 pm local time on Wednesday July 15, 1998.

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## AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

### Instructions

- Read the article "Changing the Face of Practice with Digital Technologies" (page 72) using the learning objectives provided.
- Complete the questions below, then check your answers (page 230).
- Fill out the self-report form (page 230) and submit it to receive two AIA Learning Units.

### Questions

**1.** When is the best time to hold a training session for new hardware or software? Why?

**2.** Computers make it possible for all members of an architecture firm to quickly access data. List seven types of valuable information that can be shared with communications technologies.

**3.** List four ways to be a technological leader among architecture firms.

**4.** What is the most important thing a firm's principals can do to ensure the successful integration of technology into a practice?

**5.** How can a firm's staff members help ensure the successful integration of technology into a practice?

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**CIRCLE 99 ON INQUIRY CARD**

## AIA/ARCHITECTURAL RECORD
## CONTINUING EDUCATION

### ANSWERS

Questions appear on page 228. To receive CES credits, fill in the self-report form below.

**1.** The most effective time to learn a new program or machine is "just in time," meaning almost immediately before you start using it. Offering a training session one day or even just a few hours before employees start using a new technology is ideal, because they will retain more of what they learned and be able to quickly reinforce that training. Since training is stored in short-term memory, the lessons learned are easily forgotten if not put into practice.

**2.** Communications technology allows for the exchange of the following valuable internal information in a firm: **a)** accounting of the labor budget; **b)** a complete project history; **c)** a list of active projects in a firm; **d)** human resources information; **e)** a database of invoices for billing purposes; **f)** a tracking system of hours spent on each project; and **g)** marketing leads and records of follow-up activities This is all in addition to the sharing of construction documents, which are used both internally and externally.

**3.** To be at the vanguard of technology, a firm needs an information technology director to monitor what's working and shift directions when appropriate. To promote technology advances, firms can **a)** seek out new ideas; **b)** investigate emerging technologies; **c)** take risks using new technologies; and **d)** be receptive to new ideas. An information technology director should take a deliberate approach to planning new practices and acquisitions—rather than try to be first on the block to get every technological innovation. Instead of adopting software, hardware, and practices in response to what others are doing, firms should take time to reflect on present and future needs.

**4.** Genuine commitment from principals is essential to the success of technology integration. They must not only make the financial investment, which is always a large amount, but also enforce the discipline necessary to create some degree of firm-wide conformity. To do so, it's a good idea to make the IT director part of management. Since the age of the automated practice is really just dawning, the position of IT director is relatively new. It's often held—sometimes unofficially—by a lone staff architect with an affinity for technology who has championed its application to the practice. The mantle of management helps confer the respect he or she will require to get the full participation of staff and principals.

**5.** In order for staff members to adopt technology into their methods of operation, they must be willing to accept change. Firms can motivate staff by detailing how technology will benefit the firm and its clients.

## AIA/CES SELF-REPORT FORM

*(Use to report learning units earned for ARCHITECTURAL RECORD only.)*

**Member information:**

**Last Name** ________ **First Name** ________ **Middle Initial or Name** ________

**AIA ID Number** ________

**Program/project title: Architectural Record (06.98)**

☐ "Changing the Face of Practice with Digital Technologies" (page 72)
*Completion date (M/D/Y):* _______ / _______ / _______

**Quality Level (QL) of this program:** Each article will earn you a total of 2 LUs at Quality Level 2. Fill in: ____ total LUs.

**Quality Level of each article is 2. Material resources used:**
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**I hereby certify that the above information is true and accurate to the best of my knowledge and that I have complied with the AIA Continuing Education Guidelines for the reported period.**

**Signature** ________ **Date** ________

Send completed form to University of Oklahoma, Continuing Education, AIA/CES, Room B-4, 1700 Asp Avenue, Norman, OK 73072-6400. Fax 405/325-6965. Or, to respond by E-mail, visit www.archrecord.com and click on Continuing Education. For additional information, call 800/605-8229.

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CIRCLE 101 ON INQUIRY CARD

THE FUTURE

# Robotic parking and the ever-changing dynamics of land use.

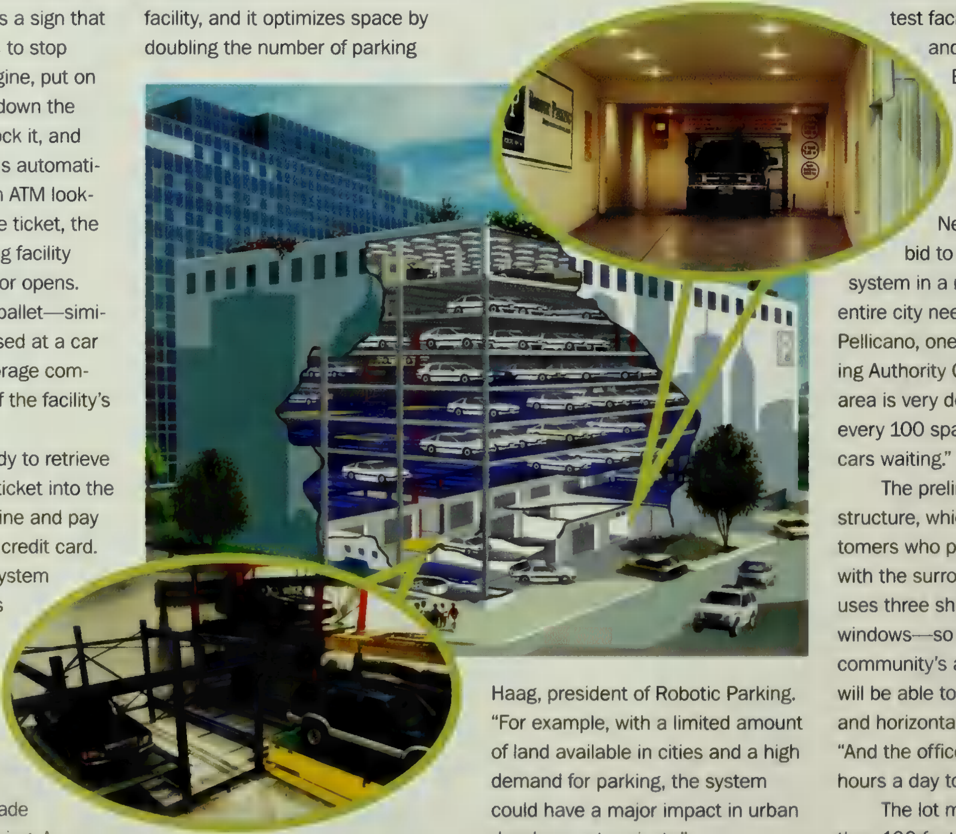
BY ELANA H. FRANKEL

Close your eyes and imagine driving up to a parking facility's clean, well-lit entry station, similar in appearance and size to a single-car residential garage. (If you live in New York City, ignore the sign that says two hours of parking costs $25.) Soon after you pull into the bay, a motion detector triggers a sign that lights up and alerts you to stop the car, turn off the engine, put on the failing brake, push down the antenna, exit the car, lock it, and step out. Then a ticket is automatically dispensed from an ATM look-alike. Once you take the ticket, the back door of the parking facility closes and the front door opens. The car is moved on a pallet—similar to the technology used at a car wash—to an empty storage compartment on any one of the facility's levels.

When you are ready to retrieve the car, you insert the ticket into the parking system's machine and pay your bill with a debit or credit card. Once you've paid, the system moves your car from its parking space to the exit bay—and away you go. You never see or speak to a garage attendant.

This scenario, not so far in the future, is made possible by robotic parking. A Florida-based company with this same name recently landed a patent for such a system of parking, storing, and retrieving cars. Called a modular automated parking system, it consists of a parking structure that can be up to 20 stories high and is made of open-steel-rack construction with a built-in computerized system. A full-time hired operator or a Robotic Parking employee at a remote location can monitor the system via an on-site personal computer running Windows NT.

The automated garage's size is about half that of a conventional facility, and it optimizes space by doubling the number of parking places of a ramp-style garage. For example, twice the amount of cars accommodated in a conventional garage that measures 200 by 300 feet can be parked in a 100-by-150-foot robotic parking structure. The robotic garage allows for so many cars because it has no ramps, no space between cars, and lower ceiling heights. And because there are no people walking around the structure, it is safer, eliminating the risk of car damage, theft, or injuries.



"This will also change the dynamics of land use," says Gerhard Haag, president of Robotic Parking. "For example, with a limited amount of land available in cities and a high demand for parking, the system could have a major impact in urban development projects."

Developers can easily accommodate parking needs because the robotic parking system can be built on a very small lot (as little as 60 square feet); on top of or under existing buildings; or as a retrofit. The cost of building such a structure, Haag says, depends on the specific circumstances, but it generally costs 30 percent less than building a conventional underground parking lot. For on-ground robotic parking, the price is the same as for conventional systems, but operating costs are lower.

Robotic Parking has built a test facility in Leetonia, Ohio, and modified earlier European and Asian designs that relied on bulky stacker crane systems. In late April the city of Hoboken, New Jersey, accepted a bid to build an automated system in a residential area. "The entire city needs parking," says Don Pellicano, one of the city's five Parking Authority Commissioners. "The area is very densely populated. For every 100 spaces, there are 110 cars waiting."

The preliminary designs for the structure, which will be open to customers who pay monthly, blend in with the surrounding homes—it uses three shades of brick and has windows—so as not to disrupt the community's appearance. "The cars will be able to move both vertically and horizontally," says Pellicano. "And the office will be staffed 24 hours a day to ensure safety."

The lot measures slightly more than 100 feet wide and 95 feet deep, and the six-story automated parking structure will store 324 cars. Because the spot is too awkward a space to hold a conventional garage, an open surface lot would be the only other alternative. And that would accommodate only 30 cars. ■

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## A Washington Saga

**Listening to Clients**

Building Types Study: **Places of Worship**

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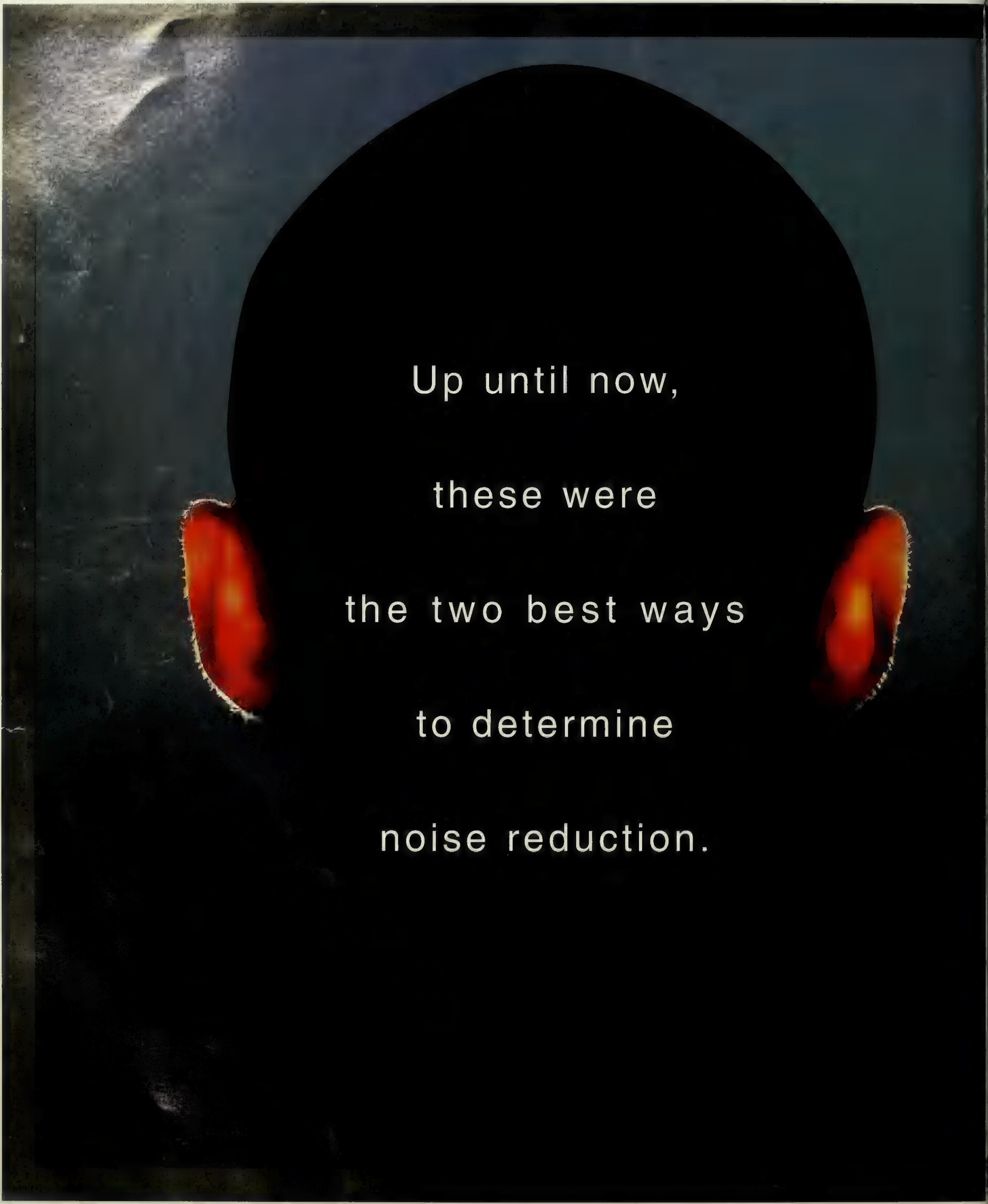
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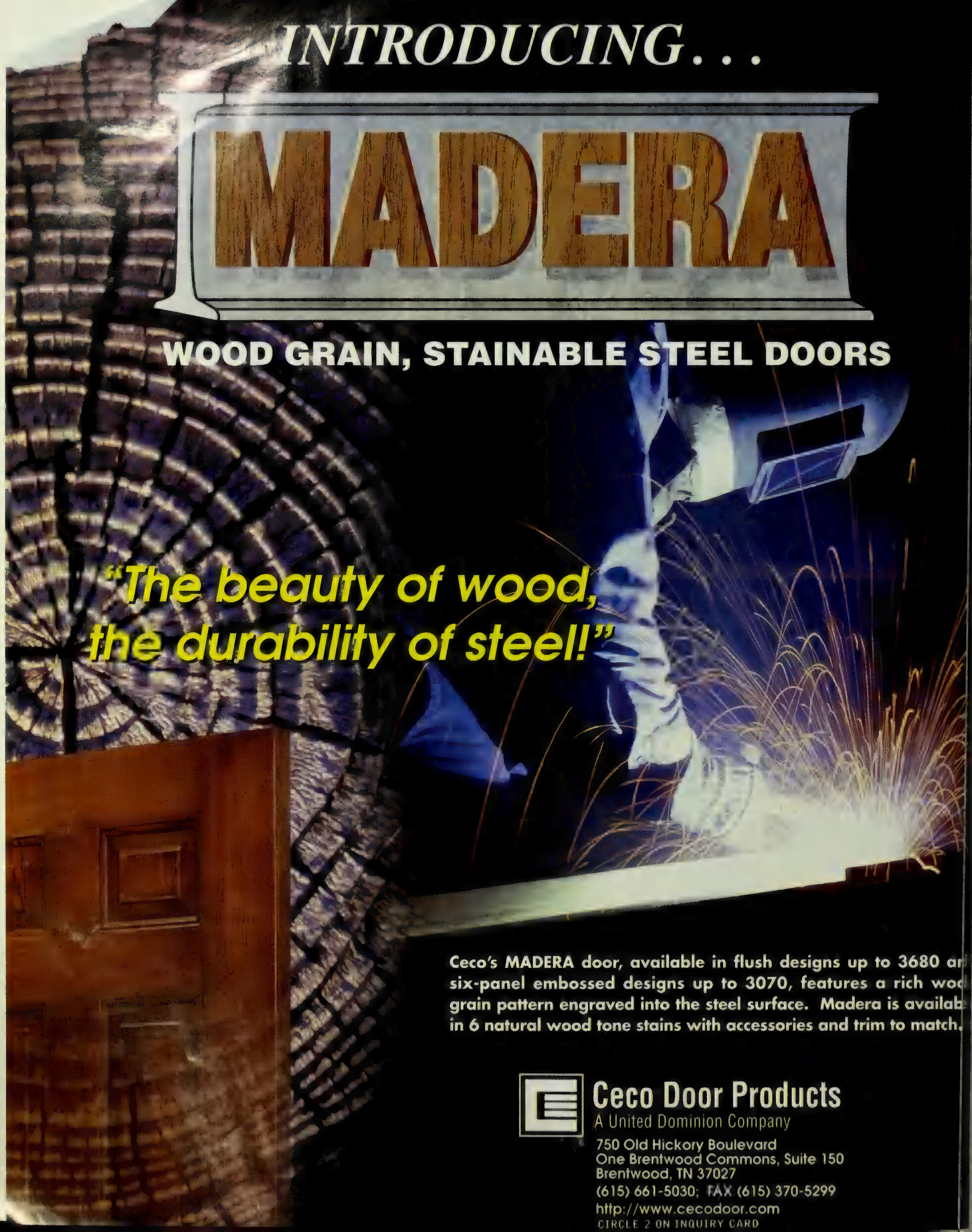
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**Continuing Education:** *The AIA/ARCHITECTURAL RECORD continuing education opportunity this month is "Understanding Accessibility Laws" (page 109). The self-report form appears on page 138.*

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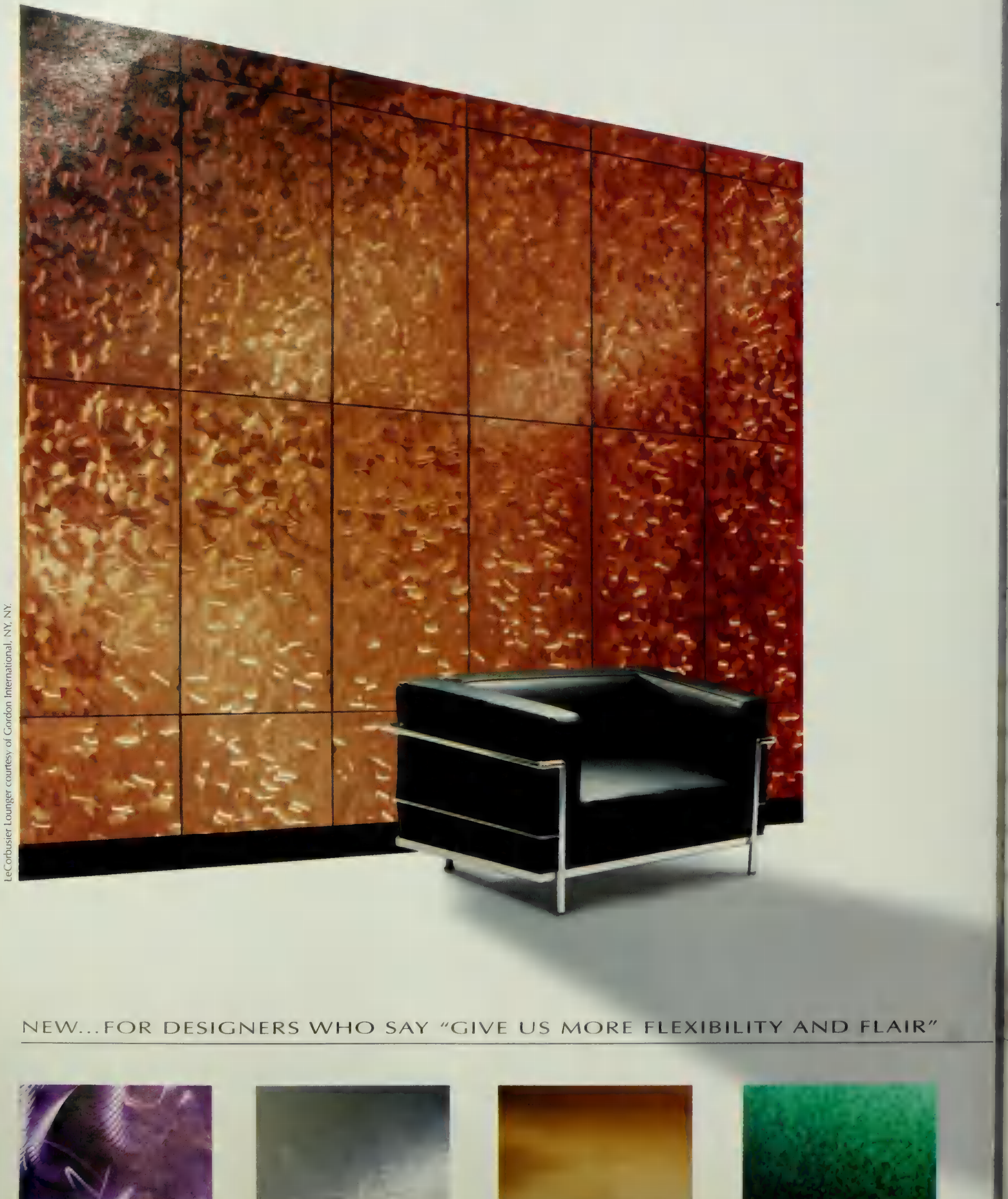
**Above:** *McNitt Building, Oklahoma City. Elliott + Associates Architects. Photo © Bob Shimer/Hedrich Blessing.*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## EDITORIAL

# Breaking the silence

BY ROBERT A. IVY, FAIA

*We are the quiet ones. Our drawings speak for us, we think, or the models that we make: we do not rely on verbal facility or elaborate rhetoric to explain what we do. One good look should be able to convince anyone of our worth to society. Architects are different, after all. Look at our personal style, somewhere east of artist and left of businessperson. Look at our work. What could be more eloquent than our buildings?*

*Our communication is primarily graphic, rich in iconography and symbol, form and texture, mass and shine, while the rest of contemporary society speaks the language of words. Architects often find themselves tongue-tied when attempting to write or speak, hindered from fully expressing themselves to their clients and communities. Our language barrier can lead to a sense of isolation, of being marginalized, and the feeling that we are not fully understood.*

*This is a common complaint among architects: we need greater confidence in writing and speaking articulately in a world in which the volume and importance of words are increasing. Professional architects are drowning in written proposals, presentations, letters of agreement, and contracts. Often every word counts, and we are too often ill equipped to deploy them. We need to be able to share our work better, with self-confidence in both our presentation and listening skills. Whole contracts hang in the balance.*

*Yet our own spoken and written language, which grows out of architectural culture, inhibits us. It is in architecture school that we begin to pick up a lingo that is jargon-laced or overly burdened with polysyllabic words, when simpler ones would do. It is as if we have willingly painted ourselves into an attractive, well-designed corner and are gesturing wildly for the rest of the world's attention.*

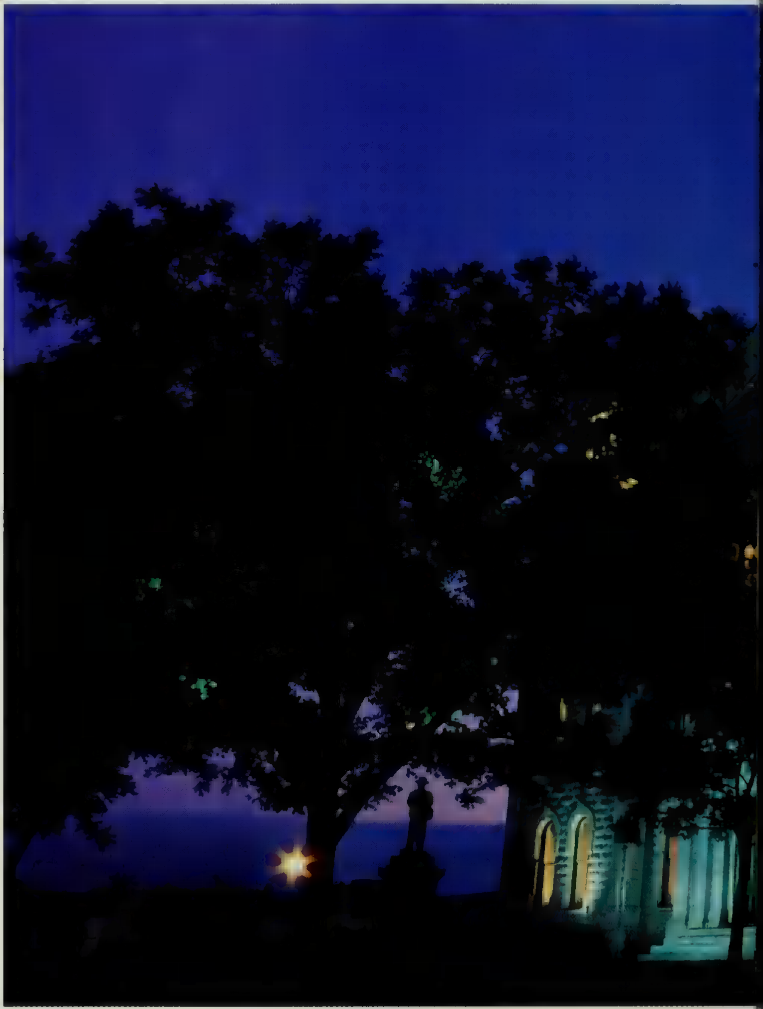
*How can we escape? Part of the answer lies in education. As the Carnegie Foundation report on architectural education pointed out, schools of architecture should be accessible places, providing opportunities for reciprocal learning within the entire university. Our training should engage with other disciplines, inviting critics from across campus and outside the university itself to participate in our juries. In addition to Vitruvius and Jane Jacobs, our reading should encompass the diverse touchstones of the larger intellectual culture, points of common reference that will allow us to share meaning, draw analogies, and create meeting ground.*

*We need to take a hard look at coursework. There is a strong argument to be made for an initial education that includes the liberal arts and sciences prior to more focused architectural studies, whether at the undergraduate or graduate level. Clemson University in South Carolina now has its architecture school integrated into its College of Architecture, Art, and Humanities. In that program, students will engage philosophy or literature, theater arts or sculpture, for example, acquiring a B.A. with a major in architecture, then progress into a more strictly directed course of study in graduate school. It is an ambitious experiment worth monitoring to see if students graduate as architects with a more balanced perspective.*

*It seems ironic. At the same moment that many architects are calling for greater rigor in architectural education, with emphasis on the realities of practice, more attention to the pragmatics of making buildings, and greater interaction with practicing professionals, this magazine proposes that we broaden our skills in the basics—reading, writing, and speaking. Compare architectural education to making a building: clear thinking and effective communication lay the best foundation for leadership. The time has come to speak up. We can no longer afford to be quiet.*

Robert Ivy

# WHEN IT CAME TO RENOVATING THIS HISTORIC COURTHOUSE, EVEN THE



In 1964, The Parker County Courthouse in Weatherford, Texas was designated a Texas Historic Landmark. And thus began the slow, methodical process of restoring it. First to receive attention was the structure's limestone stonework. Later, the roof was replaced. Then came the windows, which proved to be one of the most challenging aspects of the project.

The Historical Survey Committee mandates that if nothing remains of a historic building's original windows, the new ones must be faithful reproductions, right down to the last detail. Since the courthouse's original wood windows had been replaced by aluminum ones some years back, that meant that all 105 of the new windows had to be virtually identical to those made and installed over a century ago.

Bids were sought, but only two manufacturers felt qualified to respond. One of them, Marvin Windows & Doors, had actually been recommended by a company that was asked to bid but declined.

Though underbid by the other finalist, Marvin's figures were based on building the largest windows with structural muntin bars to withstand the winds that buffeted the building's hilltop site. Intrigued, the architect asked each company to build a sample window. One look at the prototypes and the job was immediately awarded to Marvin.

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of the courthouse and measurements of the actual openings, they designed the round tops, double hungs, circles and checkrail units that play such an integral role in the building's design. As for the largest of them, not only were they built to withstand the high wind requirements, Marvin delivered them factory-mulled to further simplify installation.

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# LETTERS

**Unsustainable rural homes**

Twenty years ago, we were designing sustainable homesteads for families that wanted to "return to the earth" in rural areas. It took us a while to recognize that these families were commuting 40 or 50 miles every day from their energy-efficient homes to jobs in the city.

Automobile-dependent transportation and the sprawl associated with it are by far the most significant perpetrators of an unsustainable future. Meanwhile, your article ["The Nature of Green Architecture," April, page 149] and most other articles discussing sustainability feature low-density rural or suburban projects.

While these romantic projects are important experiments for building technology, the ecological heavy lifting comes with rebuilding our existing cities: mass transit, recycling of massive infrastructure investments, dramatic reduction of automobile dependence, diminished encroachment on wildlands and agriculture, and, perhaps most important, increased sustainability for low-income urban populations through job creation and community reinvestment. Only infill development affords this multidimensional, multilevel synergy.

*—David J. Mogavero*
*Mogavero Notestine Associates*
*Sacramento, Calif.*

**Stereotyping New Urbanism**

Your recent article on New Urbanist projects in Turkey [May, page 82] reveals an understanding of the movement that is still tainted by media stereotypes. There is nothing about America or small towns that is essential to New Urbanism, as you suggest. Actually, the older parts of some of our *larger* cities provide a better illustration of its principles, and the design roots of such cities can often be traced to Europe (though the movement is not about Europe either).

Also, traditional styles are not intrinsic to New Urbanism. While some of its more prominent projects have relied on historical themes, it is not architectural styles but rather patterns of development—high-density, mixed-use, pedestrian-friendly—that help foster genuine community.

*—Tom Houg, AIA*
*Seattle*

**Green tower's predecessors**

ARCHITECTURAL RECORD's coverage of Foster and Partners' Commerzbank in Frankfurt [January, page 69] talks of "reinventing the skyscraper" without acknowledging that after half a century of importing inappropriate Western ideas, European architects are now being inspired by more appropriate Asian and Australasian models.

Far from being newly invented, the technology of the Commerzbank derives directly from the ideas of Harry Seidler in Australia and Ken Yeang in Malaysia. This is not to detract from the fine quality of Foster's building nor the significance of creating such icons in the West, but it is important to recognize the origins of these ideas.

*—John Fraser*
*Head of School of Design*
*Hong Kong Polytechnic University*
*Hong Kong*

It would have been appropriate in the context of your Commerzbank coverage to mention Skidmore, Owings & Merrill's National Commercial Bank in Jeddah, Saudi Arabia. Foster's triangular plan, with triangular gardens cut out at various floors, is not very different from the plan of that 1983 masterpiece in the desert.

*—Husnain Lotia, AIAP*
*Karachi, Pakistan*

**Undetermined youth**

Although the struggles endured by those you profiled in "Young Architects Profiles" [May, page 136] were indeed compelling, they are not truly indicative of the experiences of many in the profession who are at similar stages in their careers.

Several individuals with whom I graduated from architecture school in 1991 have found success in this decade without enduring the type of trauma visited upon those you profiled. A combination of talent, determination, and a desire to continue their education in the fields of real estate, business, and law has produced a generation of architects who create their own success. They reject the traditional platform of whining and weeping espoused by those whose compensation package does not match their inflated sense of self-worth. Perhaps you should consider profiling some of these people.

*—James T. Cisneros*
*Stamford, Conn.*

**Interior designers: a final word**

I have been an architectural secretary for 40 years, and having read your article on interior designers [April, page 66], now I've seen it all. They have got to be kidding. What a slap in the face to the registered architects in these firms and to all architects.

*—M. J. Crandall*
*Fort Lee, N.J.*

**Electric coverage**

An excellent choice for the cover of the May issue. I have a newfound appreciation for aboveground utility lines.

*—Peter Mullins*
*San Francisco*

**More on the haute spec house**

The Hariri sisters have created a work of art with Riverbend House ["Making a Spec House Special," April, page 70], making a powerful statement about the style of typical developer spec houses. It is unfortunate, however, that the architects were unable to acknowledge what today's developers do well.

Riverbend House has been difficult to sell because it has been subjected to the planning parameters of a 1,500-square-foot tower apartment. In the translation to a 5,000-square-foot home, there is little acknowledgement of the site, scale, or economics. The interior bathrooms for the secondary bedrooms are a dead giveaway.

When architects are given freedom in the spec housing market, they can create a home that is both aesthetically and functionally superior to what is normally offered to the public. The Hariris have only half succeeded.

*—Robert A. Pennypacker*
*Ocoee, Fla.*

**Moving tribute**

Your comments regarding the Chapel of St. Ignatius at Seattle University struck a nerve [Editorial, April, page 15]. You reminded all of us that architecture should *move* you.

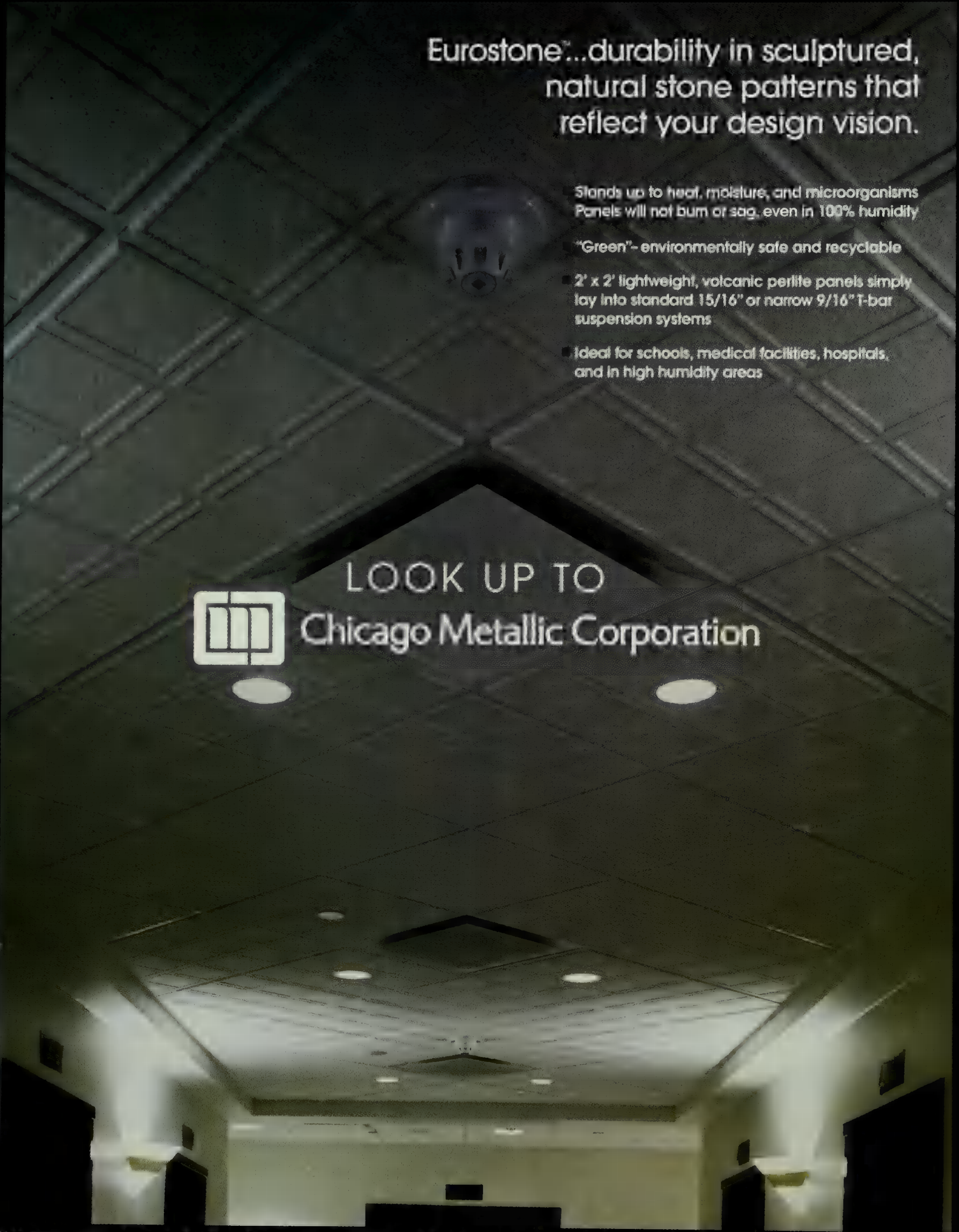
*—Rand Elliott, FAIA*
*Elliott + Associates Architects*
*Oklahoma City*

**Credits/corrections**

The architects of Valeo Electrical Systems in San Luis Potosi, Mexico (May, page 214), were Davis Brody Bond, LLP. The firm was named incorrectly in the story. In addition to Steven M. Davis, FAIA, and Christopher K. Grabé, AIA, credited personnel from the firm are Frank Michielli, AIA; Ron Eng; Susan Lee; and Mark Turkel. The project team from Ove Arup and Partners included Greg Hodkinson, partner-in-charge; Dan Brodkin, project engineer (structural); Mahadev Raman; Ross Clarke; Varughese Cherian; and Askok Raiji.

In the May essay "A New American Factory" (page 199), architectural historian Reyner Banham is misquoted. Banham did not argue that Lockwood, Greene and Company were the decisive architects on the Albert Kahn–designed Ford plant at Highland Park but rather on the 1906 factory for George N. Pierce Company. ■

*Letters may be E-mailed by visiting www.archrecord.com and clicking on News/Features/Dialogue. RECORD may edit letters for grammar, style, and length, taking care not to change the meaning.*



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# SPEAK OUT A stronger accent on life safety early in the educational process will ensure that architects design safer buildings in the future.

DAVID S. COLLINS

*David S. Collins, FAIA, is president of the Preview Group, an architectural consulting firm in Cincinnati, and is the regional manager of the American Forest & Paper Association. He was recently elected secretary of the AIA for the 1999–2000 term.*

Life safety isn't a concept solely of interest to regulators. It is, and must remain, a vital element in the process of good design. This concept must be more directly integrated into the educational curriculum in architecture schools and then carried forward throughout the architect's practice.

The disasters that cause damage to buildings—and, too often, to the people within them—are attributable to many factors. Fire is an obvious one; and, as several recent incidents have shown, high winds can also cause great damage. Losses over the past 10 years due to earthquakes have been dramatic, causing major disruptions to the entire economic fabric of many communities.

The modernizing of building codes has been a tool that elected officials have used to establish certain expectations for building performance. New technology has also provided architects with tools to create safer structures and protect the occupants within.

But it is critical that the real issues of safety, as well as the most effective means to prevent loss, be examined during the time an architect spends in school and in the internship period. Strengthening the quality of education early on is the way to develop and maintain a consistently high level of responsibility for public safety.

In an attempt to make safety and the application of codes a vital part of architecture students' educational experience, the National Architectural Accrediting Board (NAAB) has begun to change its guidelines for accrediting architecture schools.

This new direction by the NAAB, combined with the implementation of a new International Building Code in the year 2000, may bring a single model code to the United States and, perhaps as important, a single source from which educational programs and materials may be drawn.

I hope that the NAAB's guidelines will be strengthened to require architecture schools to teach basic concepts of safety so that *all* students will be able to apply this knowledge to their projects.

And there is much for these students to learn. In general, architects recognize the need for safe design and for the use of safety systems to alert occupants and reduce unavoidable incidents of loss. But these concepts can be better integrated into the educational process.

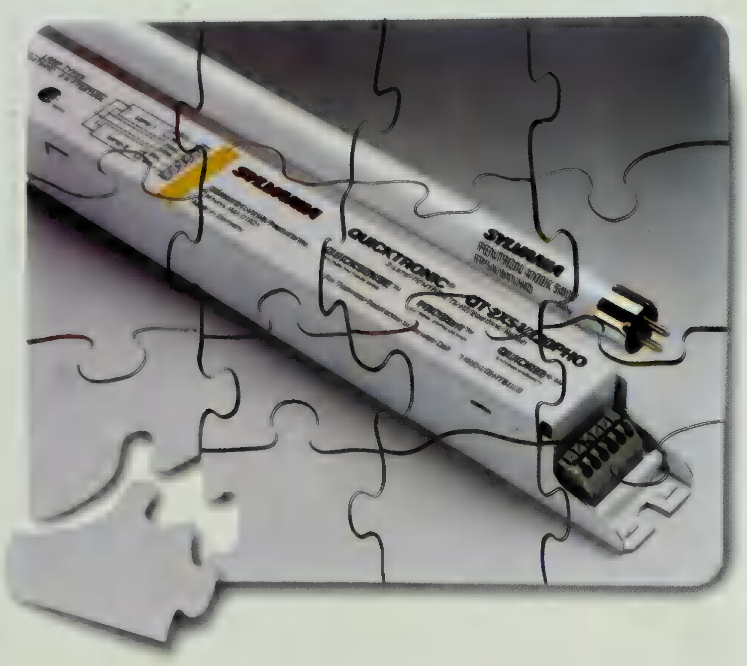
With the guidance provided by modern building codes, there are few excuses for significant loss in new structures except in the most severe situations. Major improvements in safety systems over the past few decades have had an impact on older structures and buildings that do not conform to today's minimum standards of construction safety and design.

Notably, the installation of residential smoke-detection devices has produced remarkable results in reducing the loss of life in fires. Sprinklers have long been recognized as the best method of preventing the spread of fire beyond the room of origin, and these systems are now designed for residential buildings, where the largest number of deaths occur. Wind damage is being addressed by model codes and standards agencies; for instance, the American Society of Structural Engineers is developing wind-load design standards that will more appropriately address the design of modern structures. Students should be kept apprised of these changes.

The AIA, through its mandatory education program for its membership, and the National Council of Architectural Registration Boards, through its internship competencies, have taken steps to make "health, safety, and welfare" a critical element of internship, licensing, and continuing education.

Architects are now involved in many areas of their communities, both in and outside of construction. With a keen awareness of safety issues spreading throughout the country, we can help establish appropriate standards, provide guidance and leadership for our institutions, and raise consciousness that good design means a good, safe building. ■

**Contributions:** *If you would like to express your opinion in this column, please send submissions by mail (with a disk) to Speak Out, Architectural Record, 1221 Avenue of the Americas, New York, N.Y. 10020; by fax to 212/512-4256; or by E-mail by visiting www.archrecord.com and clicking on News/Features/Dialogue. Essays must not exceed 700 words. The editors reserve the right to edit for space and clarity. Where substantial editing occurs, the author will receive text approval.*



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CIRCLE 6 ON INQUIRY CARD

# MENTORS How to deal with the unique problems of buildings that went up during the post–World War II construction boom.

*Steven M. Goldberg, FAIA (top), and Jan Keane, FAIA (middle), are partners in Mitchell/Giurgola Architects in New York City. Alan Traugott is a principal in Flack + Kurtz Consulting Engineers, an international firm headquartered in New York City.*

*At the AIA's recent national convention, Steven Goldberg, Jan Keane, and Alan Traugott spoke of how many buildings constructed in the 1960s are in dire need of revamping.* ARCHITECTURAL RECORD *asked them to condense their thoughts into a primer for those faced with the task of adapting a 1960s construction.*

The sheer magnitude of activity during the post–World War II building boom, which peaked during the 1960s and early 1970s, led to a dramatic alteration of our cities, towns, campuses, and commercial landscapes.

Unfortunately, many of these structures—which in their time were built with newly invented but not thoroughly tested products and systems—are becoming physically and functionally obsolete. Still, there is good news: renovation and adaptive reuse can often be justified over the alternative, starting from scratch. As a result, such buildings actually present great design and technological opportunities for today's architects.

The design of typical buildings of the era emphasized speed of construction, efficiency, and low cost. Structural systems consisted of modular, concrete, or steel-skeleton frames, typically with low floor-to-floor heights and little redundancy. Vast stretches of glass brought light and views, but because energy was cheap the glass was not designed to be efficient.

The purposes of many of these structures have changed, calling for modifications and expansions. Internal redesigns often include more amenities and communal facilities than had originally existed. It is often necessary to relocate or add corridors, elevators, and stairs to meet current codes and functional needs. Larger building populations require expanded recreational, dining, and toilet facilities. Many times, reconfigurations like these can be conveniently handled within modular steel frameworks because of their easily penetrated metal decks and nonbearing interior walls.

Judging from our experience, a transformation also requires the removal or conversion of outdated mechanical equipment and controls. Still-viable systems can be refitted with energy-conserving variable-speed fan drives and modern digital controls that allow reduced energy use when possible. The existing piping infrastructure can often be reused if it has been well maintained. Equipment that has reached the end of its useful life can be replaced with substantially more efficient modern versions.

Electrical systems must often be overhauled or upgraded because electrical code requirements and usage patterns have changed. New infrastructure for today's communications, video, and data systems must be designed and installed in a cost-effective way that also anticipates future changes in technology.

Many of the older wall systems don't meet today's needs, codes, and standards. Those made of prefabricated metal and glass had unexpectedly short life spans, becoming discolored and corroded. The inefficiency of these walls produces greater heating and cooling requirements and high energy costs. We have found that often such walls do not merit the expense of restoration. Instead, we replace them with the more energy-efficient systems available today, systems that use precast concrete or have a better approach to insulation.

In designing exterior additions and extensions, we have tried to undo what we consider to be a negative aspect of 1960s work: many structures were designed as "object buildings," generally unrelated to the surrounding environment. Our additions and new facades are designed to create contextual links between the buildings and their immediate vicinities.

Through our experience in renovating 1960s buildings, we have learned that wholesale changes—as opposed to minor corrections, restoration, or phased construction—are usually needed. On the other hand, for all of their aesthetic and functional flaws, the straightforward nature of these buildings has facilitated successful adaptations in terms of both context and function. ■

**Questions:** *If you have a question about your career, professional ethics, the law, or any other facet of architecture, design, and construction, please send submissions by mail to Mentors, Architectural Record, 1221 Avenue of the Americas, New York, N.Y. 10020; by fax to 212/512-4256; or by E-mail by visiting www.archrecord.com and clicking on News/Features/Dialogue. Submissions may be edited for space and clarity.*

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CIRCLE 7 ON INQUIRY CARD

# PULSE RECORD readers were asked: Should interior designers be licensed?

**Yes:** As interior designers become more involved with life safety issues in new and renovated building interiors, there needs to be a standard of knowledge to protect clients, consumers, and designers. In no way is this meant to prohibit architects from continuing to offer interior design services.
*—David D. Stone, IIDA*
*Symmes Maini & McKee Associates*
*Cambridge, Mass.*

**No:** Only a small fraction of those engaged in interior design are involved in sophisticated interior construction work. The great majority do what is more accurately described as interior decorating. The vast majority of those who would become licensed as interior designers under most proposed legislation are not required to master a body of knowledge, skills, or abilities beyond the capacity of a layperson. Also, their activities do not have a substantial impact on the health, safety, and welfare of the public.
*—Lenore M. Lucey, FAIA*
*Executive Vice President, NCARB*
*Washington, D.C.*

**Yes:** Licensure of interior designers protects the end user because qualified designers are aware of life safety issues and codes.
*—Rebecca McAdams, ASID*
*Hudson, Ohio*

**Yes:** Absolutely, but only those with professional degrees who have passed the NCIDQ exam. Why not? Interior designers have taken many of the same courses as architects and have graduated with degrees from the same universities. Architects can also design interiors, but licensed interior designers would be specialists in this area and may be more qualified.
*—Robert Carver, AIA*
*Orlando, Fla.*

**No:** States license certain occupations to protect the public, not to confer status on that occupation. Interior designers have not adequately defined what unique services they perform that should be regulated.
*—Holly Gerberding, AIA*
*Chicago, Ill.*

**Yes:** Today's interior designer is no longer an "interior decorator." Licensing is the proper form for states to regulate and oversee the profession of interior design. There must be a process that guarantees that interior designers have a minimum level of education and have passed a nationally recognized exam. Right now, anyone can call themselves an interior designer.
*—Christopher D. Bass, ASID, IIDA*
*GHK Associates, Inc.*
*Washington, D.C.*

**No:** Licensure, because of its cost to the states and consumers, and because it limits entry into a profession, is traditionally reserved for professions that, if unregulated, would pose a serious threat to public health, safety, and welfare. There is no serious public threat that is remedied by the licensure of interior designers. Design decisions that affect the public's health, safety, and welfare require the education and examination that a licensed architect brings to the job.
*—Wayne Rogers, AIA*
*AIA Licensing Committee Chair*
*Catalyst Architects*
*Columbia, S.C.*

### This Month's Question

## Are many municipal zoning policies outdated or inappropriate?

In some cities, where local zoning codes have changed little since they were implemented, myriad variances and special use approvals are needed for new construction and renovation. New York City is grappling with the proposed rezoning of its theater district, and Milwaukee is replacing its entire zoning code. Portland, Oregon, on the other hand, has a complex but accessible and up-to-date zoning code. This issue has spurred a dialogue among architects, developers, and planners who are working toward progress in city development.

**Are many municipal zoning policies outdated or inappropriate?** ☐ Yes ☐ No

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*Note: Pulse reflects individual responses to each month's question and is not meant to be construed as formal research.*

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**CIRCLE 8 ON INQUIRY CARD**

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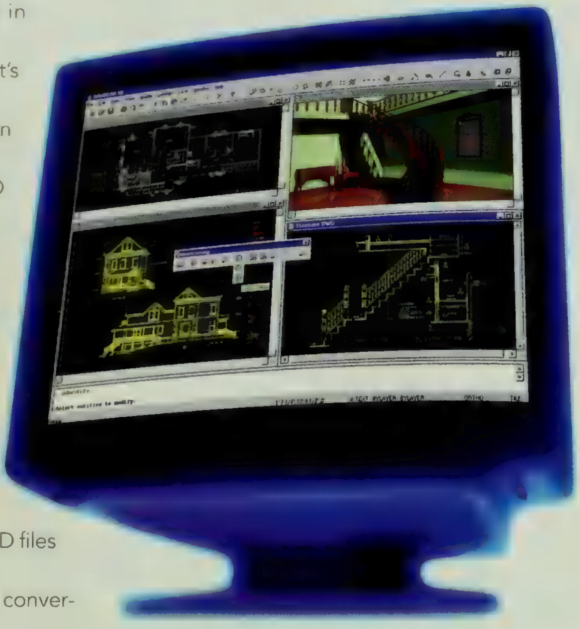

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**CIRCLE 9 ON INQUIRY CARD**

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CIRCLE 10 ON INQUIRY CARD

# BOOKS Three recent books explore the roles that politicians, citizen activists, and urban designers play in the changing form of cities.

BY JOHN E. CZARNECKI

**Capital Dilemma: Germany's Search for a New Architecture of Democracy,** *by Michael Z. Wise. New York: Princeton Architectural Press, 1998, 192 pages, $25.*

**Cities Back from the Edge: New Life for Downtown,** *by Roberta Brandes Gratz with Norman Mintz. New York: John Wiley & Sons, 1998, 362 pages, $30.*

**Representation of Places: Reality and Realism in City Design,** *by Peter Bosselmann. Berkeley: University of California Press, 1998, 230 pages, $35.*

When it comes to building cities, architects play but one role in a large, complex production. The real forces that drive the shaping of urban form often include political and economic powers, planners, and an engaged citizenry—who ultimately enable the architect to transform a vision into built reality. Two recent books examine how these forces are agents of change in the built environment. A third analyzes different visual representations of the resulting cities.

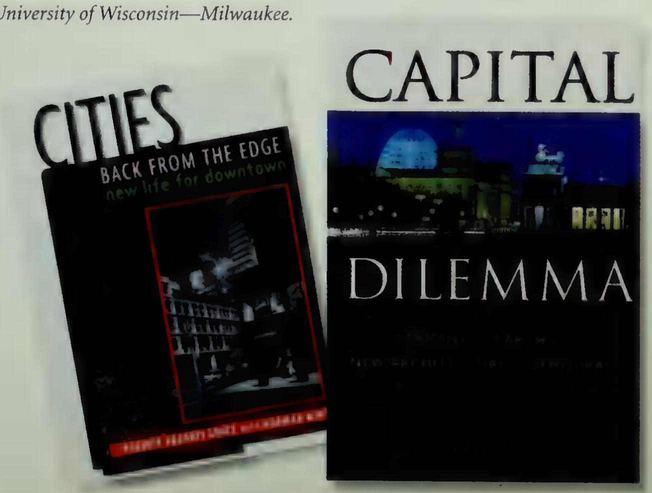
Political ideology expressed in architecture is what the reunified, democratic Federal Republic of Germany struggles with as it prepares to move its capital from Bonn to Berlin by the year 2000. Michael Z. Wise reveals the story behind Germany's literal reinvention of itself and its construction of a new national identity in *Capital Dilemma: Germany's Search for a New Architecture of Democracy*. As its future capital is rebuilt, at a cost of approximately $12 billion, the country must constantly ask the question: How will a democratic Germany portray itself through its architecture to its citizenry and the world? From Wise's account, the Germans have not found an easy answer.

Wise, a journalist who covered Central Europe for the *Washington Post*, delivers a well-researched and thorough account that weaves together the political and design history of Germany's civic architecture of the past century. From Prussia, Bismarck's empire, and the Third Reich to a divided postwar country and now a reunited democracy, Germany has a remarkable palette of structures to work with in rebuilding.

The biggest challenge that Germany faces is dealing with the memory of Hitler without presenting itself as an aggressive power. Wise notes that Germany would rather promote what Chancellor Helmut Kohl has called "a European Germany rather than a German Europe." Thus, the new Presidential Office, Chancellery, Parliamentary Offices, and Federal Strip and renovations of existing buildings have to represent a proud but restrained democracy. The result, Wise writes, is that "the new Berlin is less exuberant, experimental, and expansive than the unified German capital of which some had dreamed, and which others had dreaded."

*John E. Czarnecki, a former editor of* Crit, *the AIAS national journal, is a graduate architecture student at the University of Wisconsin—Milwaukee.*

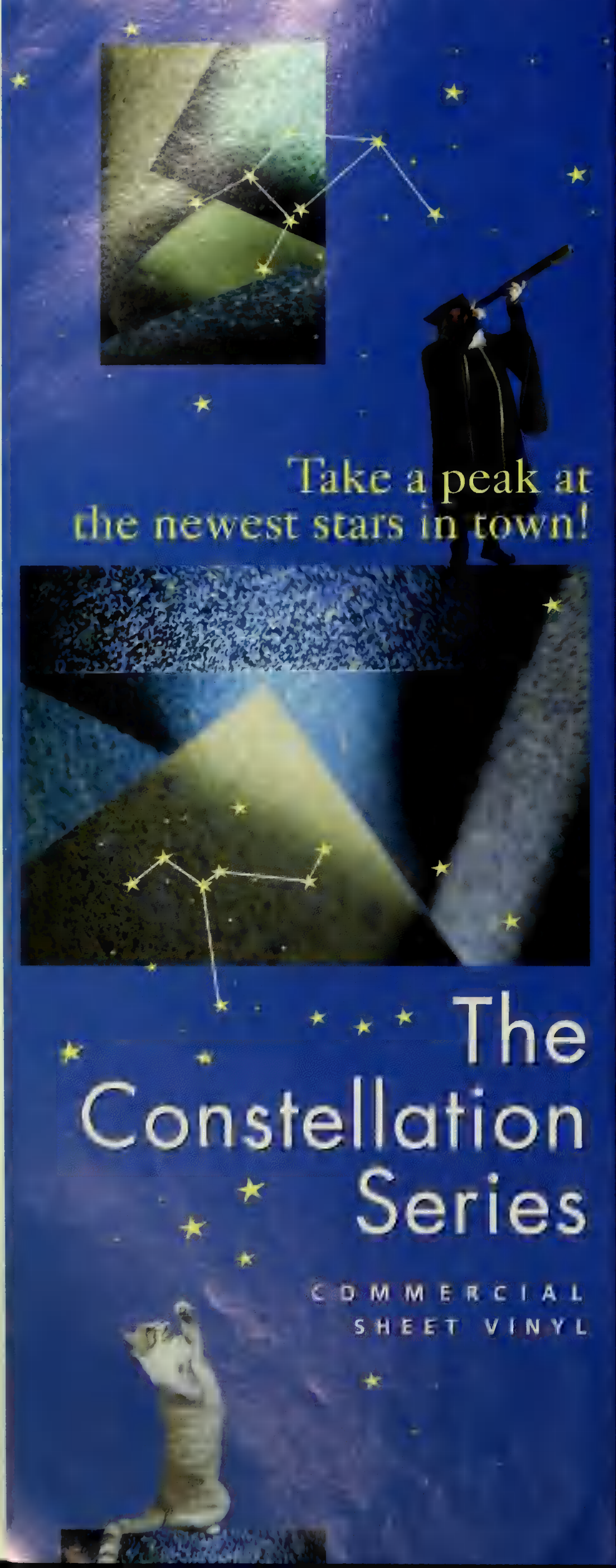
For historians, Wise accurately spells out how Germany is moving forward with "an obsessive degree of caution." But while other massive capital projects such as Brasilia, New Dehli, and Canberra are mentioned briefly, a broader framework is necessary to assess Berlin's master planning efforts as a world capital. Also, architects may desire a more in-depth discussion of the people who are designing the new Berlin and some of the battles they have had to wage.



### Urban husbandry at work

Places that experience change incrementally, rather than through large-scale development, are those that offer the best amenities for cities, states Roberta Brandes Gratz in *Cities Back from the Edge*. Gratz, a journalist and urban critic, worked with Norman Mintz, a consultant on downtown revitalization, to identify what has worked and what has not in the downtowns of cities and towns throughout the United States.

The lengthy text successfully defines the difference between what



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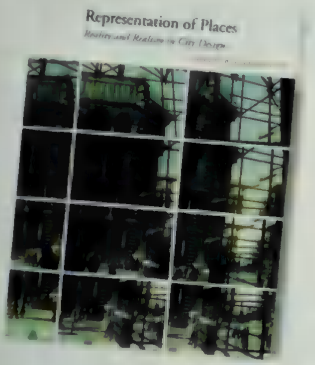


Gratz and Mintz call "project planning"—the rebuilding of downtowns with large, expensive schemes produced by bankers, planners, politicians, and developers—and "urban husbandry"—incremental, modest changes to the city initiated by citizen efforts that, collectively, infuse greater vitality into downtowns. Ranging in scope from SoHo to the effects of superstore retail, the book offers valuable lessons for citizen activists and architects on how cities really work.

**Representing city design**

Architects and urban designers may find that Peter Bosselmann's *Representation of Places* has varying degrees of relevance to their work in the design of cities. A professor of urban design at the University of California at Berkeley's College of Environmental Design, Bosselmann makes the case that the representation of urban design, from two-dimensional maps to perspective drawings, serial vision sketches, and now three-dimensional computer-generated walk-throughs, has evolved slowly and has yet to find a completely accurate mode. A reasonable assertion, but the three case studies from Berkeley's Environmental Simulation Laboratory used to support his argument are self-serving and already dated.

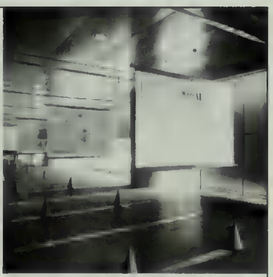
More informative, however, is Bosselmann's critical essay on the search throughout history for a visual language in design. This includes a comparative analysis of a walk through Venice via serial vision sketches and analogous walks in 14 other cities mapped in figure/ground drawings. Bosselmann's treatment nicely illustrates how the direct experience of a place cannot be conveyed precisely through mapping devices.

**Briefly Noted**

**Renzo Piano Logbook,** *by Renzo Piano; introduction by Kenneth Frampton. New York: Monacelli Press, 1997, 288 pages, $30.*

Many readers peruse architectural monographs for their evocative color photographs or drawings. Although *Renzo Piano Logbook* boasts some 1,000 illustrations, 900 in color, this is not a monograph in the traditional sense. The illustrations may seize your attention, but the accompanying text, written by Piano himself, is what makes the book rich.

Rather than offering the refined prose, bland design statements, or ego-driven monologues often found in monographs, Piano acts as a storyteller. The architect's text is an honest first-person discussion of not only his own work but also the state of the architectural profession. There is much to learn about his design process in the book's chronological presentation, from detail tectonics to client collaborations and the evolution of cities. What Piano has accomplished is to create a welcoming means to present his projects—to, as he writes, "introduce them in the way that you would introduce friends." ■



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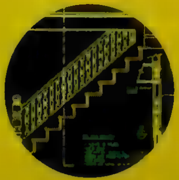

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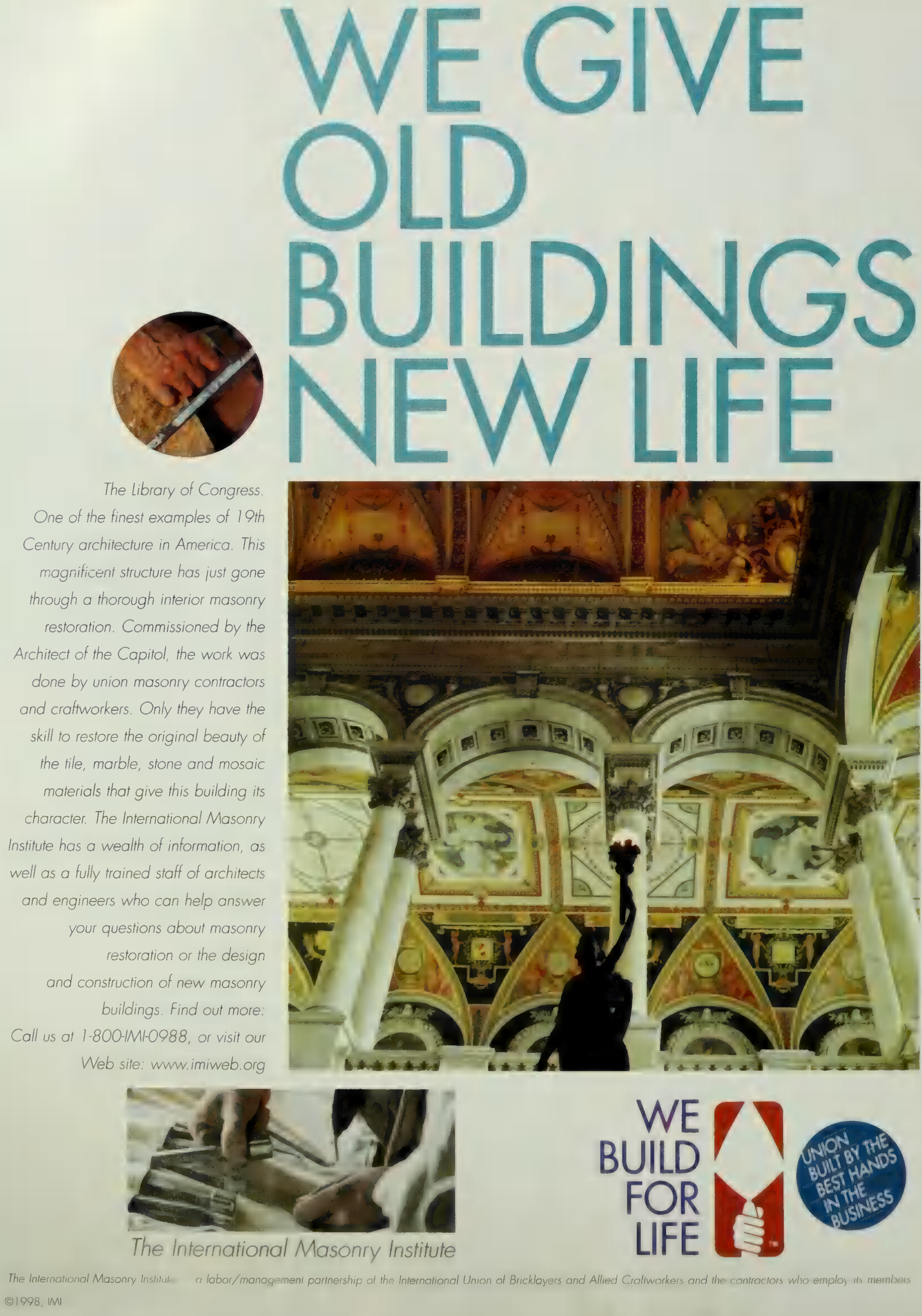

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# CORRESPONDENT'S FILE At the urging of a mayor intent on leaving his mark, the city where the skyscraper was born is piling up public works.

BY BLAIR KAMIN

*Blair Kamin is the architecture critic of the* Chicago Tribune *and a contributing editor of* ARCHITECTURAL RECORD.

Chicago is often called the city of architecture, but it has also become one of the country's most architect-friendly governments. Several alumni of local design firms have a hand in running the show, heading three of Mayor Richard M. Daley's cabinet-level departments and playing a major role in a popular—albeit aesthetically conservative—public works program that puts architects on equal footing with engineers.

The number of high-ranking Chicago bureaucrats with architectural experience, which almost surely has no equal among major American cities, isn't surprising if you are aware that Daley—son of the legendary "Boss," Richard J. Daley—is a public works fanatic. From the back of his chauffeured car, he looks out the window and scribbles notes to aides when he sees an unfilled pothole or something else he doesn't like.

He does like trees; thousands have been planted since he was first elected in 1989. He also likes wrought-iron fences. Before the 1996 Democratic National Convention at the United Center, where Michael Jordan and the Bulls play, businesses near the arena received a letter from city officials "suggesting" they tear down their ugly chain-link fences and replace them with wrought iron, which the mayor considers more stately. Most complied.

Daley's attention to the tiniest details is, like everything that goes on in Chicago, rooted in politics. Early in his mayoralty, he wanted to be a master builder like his father, who oversaw the construction of everything from Chicago's expressways to O'Hare International Airport (which the elder Daley, Irish to the core, called "O'Hara"). As a result, Daley the Younger spent his political capital on big-ticket items like a $1 billion downtown trolley system. When most of the projects went nowhere and his reelection prospects looked dim, he quickly learned his lesson: small can be beautiful, too.

"People care about what they see out their front window," he told the *Chicago Tribune* in 1996. "The big projects always have the same players; you either get them done or you don't because of politics and money. But the detail work, the wrought iron, [along with] the streets, crime, the schools. That's what you do."

That's where Daley's design mavens come in. Their job is to make the city—and the mayor—look good. The team includes Christopher Hill (formerly of Pappageorge Haymes Ltd.), who heads the Department of Planning and Development; Thomas Walker (formerly of Lohan Associates), who runs the Department of Transportation; and James Law (formerly of Ullman & Fill Architects), who directs the Mayor's Office of Special Events, which runs festivals like the popular Taste of Chicago. Jeff Boyle, a former architect at Skidmore, Owings & Merrill, preceded Walker and Hill in the transportation and planning posts.

**Renovation of the Roosevelt Road Bridge, just south of the Loop, was completed in 1995.**

With Daley's backing, the officials have had a significant impact, helping to place cherished landmarks like Ludwig Mies van der Rohe's Lake Shore Drive apartment high-rises on the city landmark rolls and putting a strong emphasis on architecture in tourist promotions.

But their influence has been most visible via a widely acclaimed public works program that has upgraded the design of bridges and viaducts, subway stations, street furniture, schools, and plazas.

Some of the projects, like SOM's 1996 renovation of State Street, which transformed a 1970s transit mall into a powerfully scaled, beautifully defined public space, have won national AIA urban design awards [see RECORD, May 1998, page 127]. Others, like the new lakefront Museum Campus by Teng & Associates, which unites the city's three natural science museums on a single greensward, result from bold urban planning moves—in the campus's case, moving Lake Shore Drive's lanes away from the lakeshore. All told, the city has spent about $1 billion on infrastructure since Daley became mayor.

Under previous regimes, architects "weren't getting enough input on the projects," says Boyle, now an executive at a Chicago real estate development firm. "We were concerned with engineering solutions—the thickness of concrete—and less concerned with aesthetics."

Daley's attention to design makes Chicago an exception in a nation where architecture is rarely on the public agenda. While a few architects, like Seattle mayor Paul Schell, Hon. AIA, and former Charlotte, North Carolina, mayor Harvey Gantt, FAIA, have held positions of power, the profession generally has shied away from politics.

"When [architects] do get in the fray, they're very useful," says Nancy Somerville, Hon. AIA, the AIA's vice president of component affairs. "But getting them in is hard."

In Chicago, a $42 million bridge renovation completed in 1995 is a prime example of how the tide has turned in favor of design. Bisecting an affluent neighborhood of town houses and single-family homes a half-mile south of the Loop, the reconstructed Roosevelt Road Bridge replaced a portion of a span built in the late 1920s.

The city's initial proposal, a utilitarian design straight out of an engineer's manual, drew cries of protest from area residents at a hearing required by the U.S. Intermodal Surface Transportation Efficiency Act. "They beat the tar out of us," remembers Stan Kaderbek, the city's chief bridge engineer, who worked with Boyle on the project. "It was a classic defining moment."

Boyle brought in a fellow Skidmore graduate, Diane Legge Kemp, FAIA, now a principal at Decker Legge Kemp Architects (DLK). She fashioned a bridge that features obelisks in three sizes, towering fluted lampposts, finely detailed planters and retaining walls, and figural sculptures that symbolize the bridge's link between the University of Illinois and the cultural institutions that comprise the lakefront museum campus.

Despite its fussiness, the bridge is an exercise in urban appropriateness that works on two scales: a city scale that recognizes Roosevelt Road's identity as a key east-west arterial of the 1909 Burnham Plan, and a neighborhood scale that allows it to blend comfortably with its surroundings. Above all, it is a place, not simply a passageway.

The project also set a precedent for quality. When the poured-in-place concrete retaining walls showed flaws, Kaderbek told the contractors to jackhammer out 1,000 linear feet of the stuff. The

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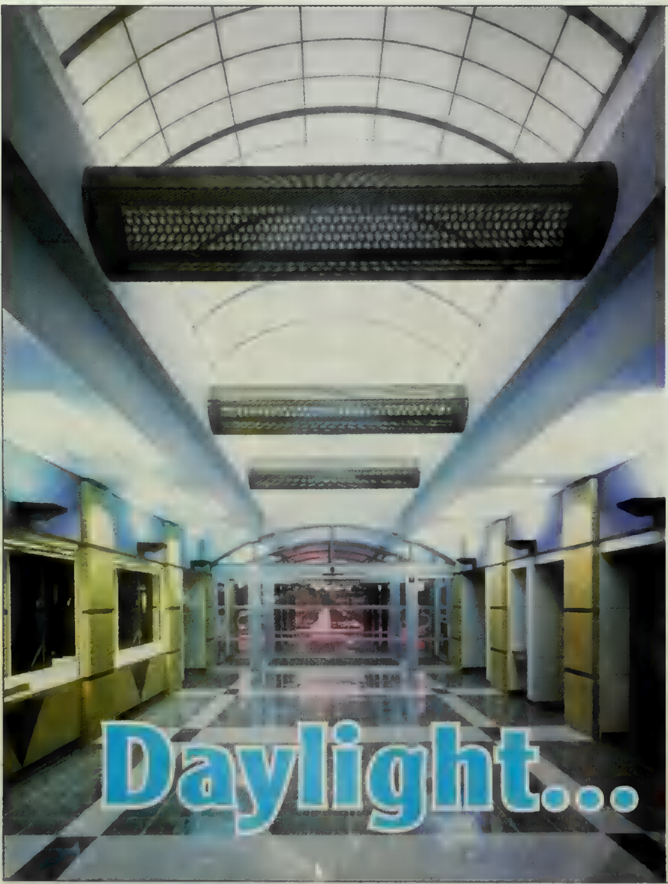

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city and the contractor shared the cost. The bridge renovation went on to win a special recognition award from the Chicago chapter of the AIA in 1996 and set the stage for high-quality but aesthetically conservative work that rejects the City Functional and reembraces the City Beautiful.

These emphases have been evident in other public works, whether small-scale bridges in Chicago's outlying neighborhoods or large-scale downtown projects, like DLK's 1995 renovation of Congress Plaza, a Beaux Arts tour de force that improved pedestrian access to Grant Park from the Loop. It, too, won a national AIA award for urban design. The city also plans a neoclassical look for the renovation of Wacker Drive, the double-decked boulevard that sweeps around the edge of the Loop.

When it comes to projects like these, Chicago isn't bursting with cutting-edge design—nor should it be, say those overseeing the work.

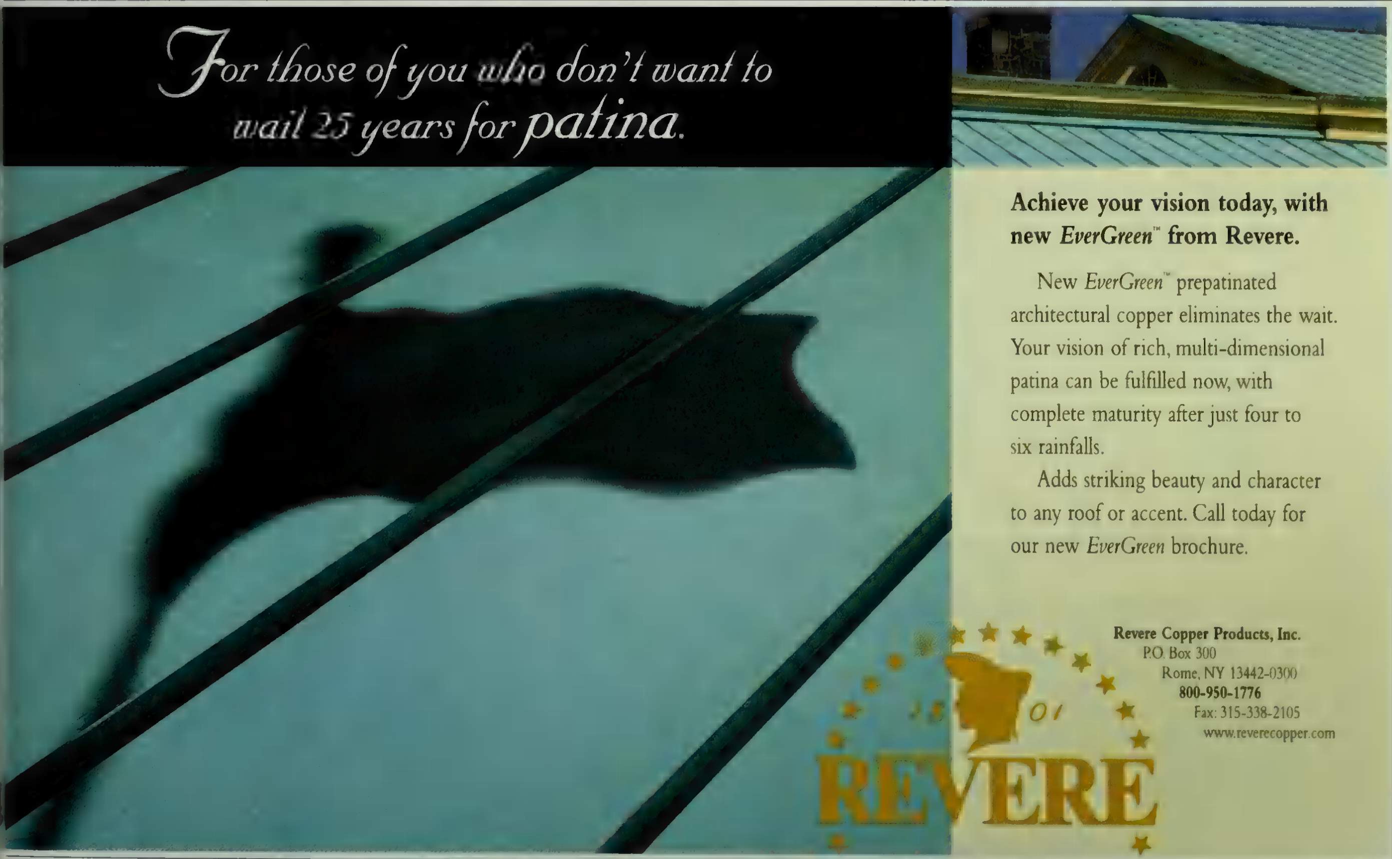
**The new museum campus (above); DeStefano's arches (far left); the redone Congress Plaza (left).**

"People, by and large, are conservative," says Kaderbek. "[Daley's] style is conservative. For the people of Chicago, it works, though we also have done crazy stuff."

A rare Modernist statement was made in a largely Puerto Rican neighborhood three miles west of the Loop, where DeStefano and Partners designed two spectacular steel arches stylized in the form of a Puerto Rican flag. Located about a half-mile apart and framing a shopping district, the three-year-old arches consist of an overhead network of steel tubes weighing 50 tons and are popular with the local residents.

Not everything has gone smoothly for Daley. With so many projects being trotted out—the administration seems to announce a new public works initiative every week—there have been inevitable blunders, like a proposal for a 70-foot-tall decorative pylon just south of the Beaux Arts Michigan Avenue Bridge. The overwrought flagpole would have maligned the district around the bridge, which consists of renowned, soaring 1920s skyscrapers like the neo-gothic Tribune Tower and the Spanish Revival Wrigley Building. Fortunately, Daley came to his senses and killed the project. Generally, however, Chicago's public works program is exemplary, showing how cities can elevate mundane infrastructure projects—and the public realm—to new levels.

Moreover, the program's emphasis on connective tissue rather than isolated monuments is undeniably sophisticated, strengthening the fabric of the city as a whole. While the projects lack sizzle, all the details add up, making a powerful impression on outsiders—and on Chicago voters. And surely that must please Daley. He's running for reelection next year. ■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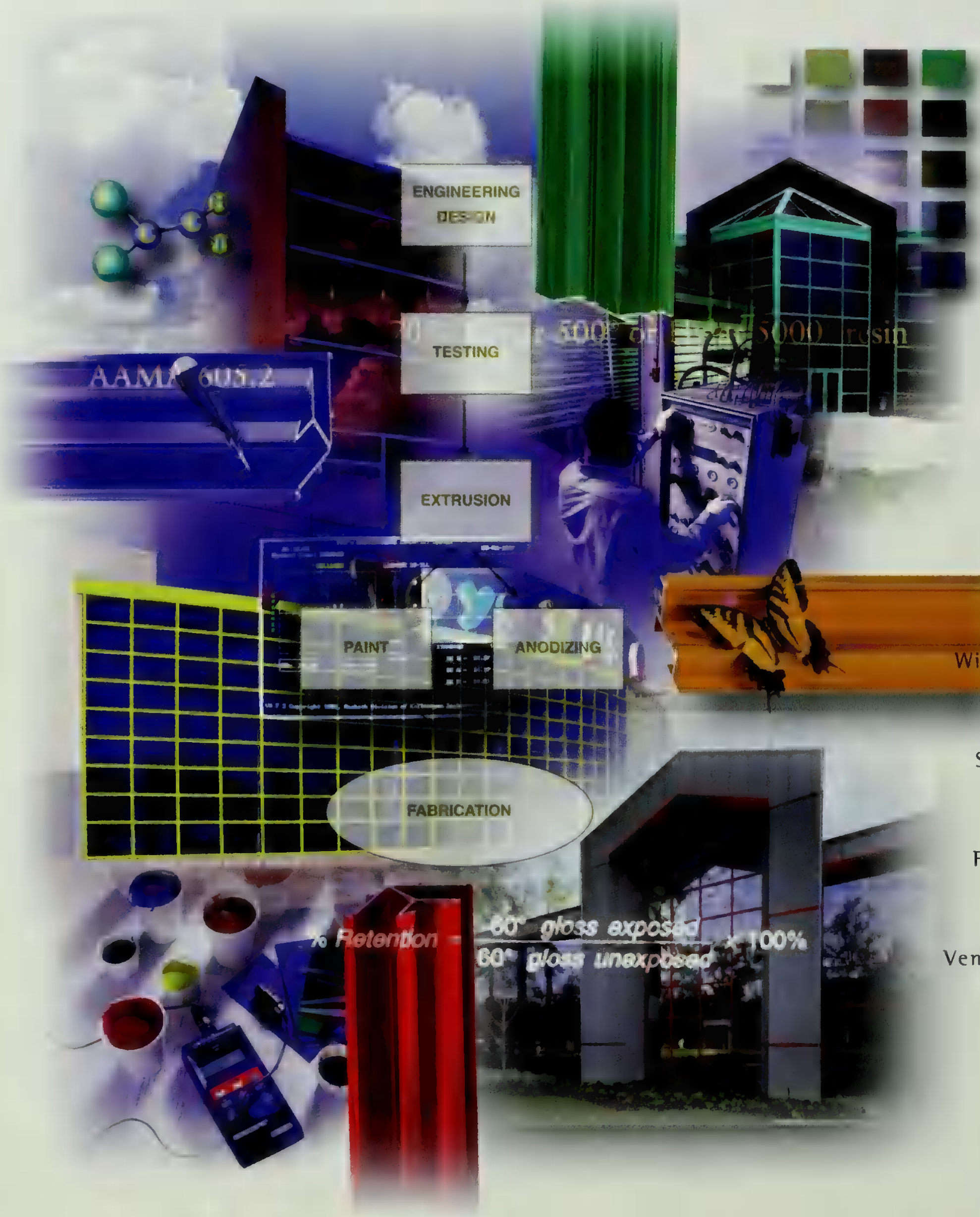

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## TRANSPORTATION EQUITY ACT MEANS MORE PROJECTS WILL GET ON THE ROAD

When President Clinton signed the Transportation Equity Act for the 21st Century on June 9, it meant that at least $195 billion in federal funds will be flowing into highway and mass-transit projects over the next six years.

The final numbers are down from the $217 billion in the House-passed version and $214 in the Senate's bill. But the figure represents a 27 percent jump over funding in the Intermodal Surface Transportation Efficiency Act of 1991. And besides the obvious boost to overall transportation markets, the other good news for architects is that key programs established in ISTEA were retained and expanded.

In particular, the Transportation Enhancement Activities program is projected to grow to an average of about $630 million annually, from $450 million a year under ISTEA, says Roy Kienitz, director of the Surface Transportation Policy Project.

This category uses Highway Trust Fund dollars for bikepaths, walkways, and historic preservation of buildings such as rail depots. The joint House-Senate conference report on the new "TEA-21" law adds "transportation-related museums" and visitor centers to the list of eligible projects. Among other areas, the bill should also give a boost to the Congestion Mitigation and Air Quality program, which finances multipassenger vehicle lanes and similar projects.

Daniel S. Wilson, the AIA's director of federal affairs, says that if recent trends in enhancement spending hold true, architects will be able to participate in about 45 percent of the new funding pie in projects that are "right up their alley," including historic preservation.

Wilson also notes that TEA-21 specifies a separate enhancements category for mass-transit funding. The amount is small—only about $160 million of the $36 billion allotted for mass transit. But, Wilson says, "It gets you in the door."

Much attention was drawn to the 1,850 "high-priority" highway projects in the bill, totaling some $9 billion. But Wilson counts 104 enhancement items in the bill. Perhaps the most notable project involves $40 million to turn Manhattan's James A. Farley Post Office into a new rail station.

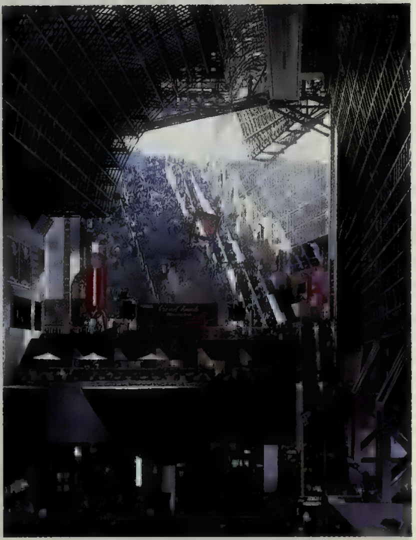
Though TEA-21's main drafters focused on increasing funding and ensuring that more will be spent, the lawmakers did include some policy changes. For example, under TEA-21, metropolitan-area and statewide planners need to consider only seven factors in reviewing projects. ISTEA mandated 16 factors for metropolitan planners and 23 for statewide planners. The new statute also permits the same firm to perform an environmental review on a project and then do the design, as long as state officials vouch for the firm's objectivity.

The new law seeks to ensure that most of the sums authorized will be spent according to what lead House negotiator Bud Shuster (R., Pa.) terms "ironclad firewalls," designed to protect against diversion of Highway Trust Fund dollars to nontransportation programs.

Funding is pegged to annual fuel-tax payments into the trust fund. The U.S. Department of Transportation says $159.1 billion will thus be guaranteed for highways, $36.25 billion for transit, and $2.9 billion for safety over the six-year life of TEA-21.

The measure authorizes an additional $19 billion over six years, bringing the total on paper to $217 billion. But that $19 billion depends on future congressional appropriations. *Tom Ichniowski*

**KYOTO STATION MAKES A MAJOR IMPACT** In September 1997 the reconstructed Kyoto Station opened its doors for the first time. The event not only marked the completion of one of the city's few contemporary landmarks but put to rest much of the debate that has surrounded the project ever since Tokyo architect Hiroshi Hara won the limited competition for its design in 1991.



The controversy involved how to build appropriately in Japan's mecca of traditional culture. Against the backdrop of Kyoto's contemplative temple precincts and meticulously manicured gardens, any new construction was bound to stand out.

While the new station is slightly shorter than the 200-foot-high Kyoto Hotel, the city's tallest building, at 2.5 million square feet it is by far the biggest. And, clad in reflective glass, granite, and metal panels, it is impossible to miss. On the inside, the monolithic structure is an assemblage of pedestrian-scaled components, organized around a huge man-made valley in the center. A one-story plinth, anchored by a department store at one end and a hotel at the other, serves as the base for the building's artificial landscape and separates it from the inner workings of the ground-level station, which comprises only 5 percent of the total area.

Like many transportation hubs in Japan, Kyoto Station is a marriage of civic and commercial functions, although it does attempt to rise above pure commercialism. Shops and restaurants are interspersed with public spaces such as the Daikaidan (big stairs) connecting the central concourse, and the Sky Garden crowning the building's west end. With a captive audience of some 300,000 visitors daily, the clients, West Japan Railway Company and the Kyoto Station Building Development Co. Ltd., couldn't afford to forgo lucrative advertisements altogether; but instead of having the typically cluttered and disorderly array of billboards, they asked advertising sponsors to team up with artists such as Roy Lichtenstein and Tadanori Yokoo to enrich the visual field.

Inside the mammoth station (top); a view from the station toward traditional Kyoto.

Though the striking forms and expressions may be more natural to fast-paced Tokyo, there is a place for them in Kyoto, maintains Yukio Kawase, an architect with Hara's firm, Atelier Phi. Kyoto has to be preserved—but cities must continue to grow, evolve, and build, Kawase says. ***Naomi Pollock***

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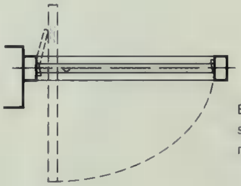

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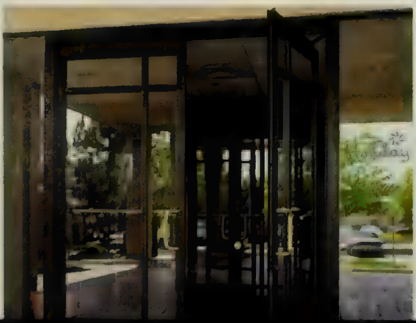

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# PROPOSITION 224 IS VOTED DOWN, TO RELIEF OF CALIFORNIA ARCHITECTS

After an extensive and vociferous statewide campaign, private-practice architects had their way in California on June 2 when Proposition 224 was met with a resounding no vote.

If it had passed, the proposition—sponsored by one of the state's most influential public employee unions, Professional Engineers in California Government (PECG)—would have dictated that state and local governments use a new process before contracting out certain construction-related services. To the relief of the broad-based coalition that had instigated a two-year-long effort against it, the measure was defeated by a margin of 54 to 46 percent.

"We let PECG know that the architectural profession would not sit idly by while they created the largest A/E firm in the world funded by taxpayer dollars," said M. Arthur Gensler Jr., FAIA, after the vote.

Proposition 224 would have added to the state constitution an expensive new cost-benefit analysis scheme to weigh the cost of doing engineering work with state employees against the cost of using outside firms. Competitive bidding would generally have been required for state-funded engineering or design contracts of more than $50,000.

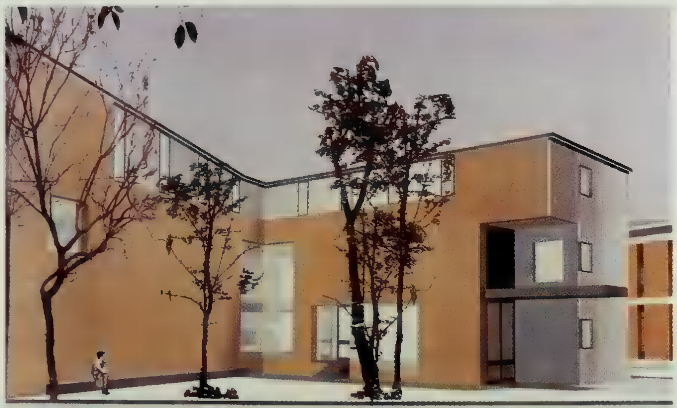
Contracts with private firms would have been prohibited where work by civil service employees was less costly, unless there was an "urgent need" for the contract.

California architects argued that local governments, schools, hospitals, and the like should have the choice of hiring the most qualified designers and engineers. And they are glad that for the moment, the processes for contracting out construction-related services will not be changing. *Soren Larson*

**PARIS GOES GAGA FOR LE FOOTBALL When the World Cup ends on July 12, Paris will not only have hosted soccer matches watched by billions of fans around the globe but will have transformed itself into a city-wide arena, with no landmark left untouched.**

**It all began with the June 9 parade where gigantic soccer-playing robots came to life at four famous sites—the Eiffel Tower, the Arch de Triomphe, Garnier's Opera House, and the Pont Neuf—and roamed the boulevards along the Seine, accompanied by original music and exceptional lighting on city monuments. A giant soccer ball topped Napoleon's Egyptian obelisk on the Place de la Concorde, with television screens instead of the traditional black-and-white panels. These were joined by even larger projection screens on five public plazas, including the city hall.**

**New architecture was also commissioned. One project, the $3 million Adidas Football Park (left), sits on top of the esplanade at Trocadero, where a 400-seat mini-stadium was built alongside temporary pavilions stretching to the Eiffel Tower. Not to be outdone, Nike built its "world of soccer" complex below the Grande Arche at La Défense. However, unlike the great international expositions of the past that gave us the Eiffel Tower, none of these structures will leave a lasting architectural imprint on the city. *Claire Downey***



# HOLL'S REDONE DESIGN GETS GO-AHEAD FOR MINNESOTA ARCHITECTURE SCHOOL

Nearly 10 years after unveiling plans for an addition, the College of Architecture and Landscape Architecture at the University of Minnesota has received state funding to begin construction on the expansion, which is being designed by Steven Holl Architects of New York.

Yet the $26.4 million addition and renovation budget, approximately half of what was originally proposed, means a smaller project. Holl went back to rework a design that won him and co-designer Ellerbe Becket a P/A Award in 1990.

The original proposal featured a circular scheme that rose two stories above the existing building, a Modernist brick box built in 1960. Despite the dramatic curving form, some critics complained that the 90,000-square-foot proposal with its interior courtyard overpowered the existing building.

Their complaints are now irrelevant, as Holl essentially discarded the original design and introduced a new scheme for a 45,000-square-foot addition. The new concept is less overpowering, but no less dramatic. Holl replaced the doughnut-shaped configuration of the first design with a slightly curving, three-story cruciform plan to house a library, an auditorium, a lobby, studios and classrooms, and research and administrative offices.

While the earlier design looked inward, the new scheme looks outward toward the campus. The ends of each masonry-clad wing will feature a translucent glass wall with smaller transparent windows. In addition, a series of seasonal gardens tucked between the quadrants will enhance the campus's landscaping.

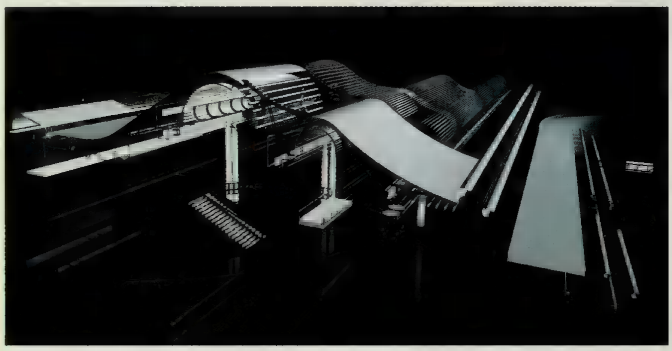
The addition and renovation budget includes upgrading the mechanical and electrical systems in the existing facility, with some interior revamping of the structurally sound building. Once completed, the college will unite its diverse programs and departments under one roof, including the renowned Design Center for the American Urban Landscape.

Thomas Fisher, dean of the college, believes the new facility will help promote the Twin Cities design community. "Universities are geared to push the envelope and get people thinking," he says. "This building pushes that envelope in terms of its innovative architecture and landscaping. With the expanded facility, we will have a central space for the Twin Cities design community, and a state-of-the-art college to continue to attract strong students."

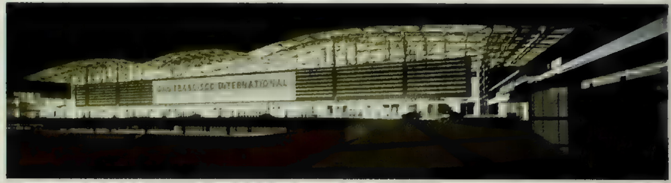
Groundbreaking is scheduled for June 1999, with completion slated for January 2001. Vince James Associates of Minneapolis is the associate architect, and Ellerbe Becket is engineer and landscape architect. *Eric Kudalis*

## FOCUS ON: AIRPORTS

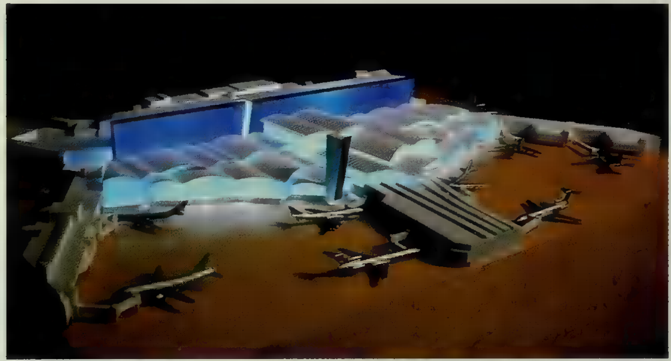
**Aiming high** Today's airport planners are emphasizing in-terminal malls, connections to existing urban infrastructure, and—to give travelers a lasting image of a city or region—picturesque design. As with train stations, glass is being used in abundance, requiring tinting, fritting, or some other means of preventing solar-heat gain. The price of all these new priorities is huge; the new Hong Kong International (to be covered in RECORD this fall), which features a terminal designed by a group including Norman Foster, cost $9.8 billion. Still, many municipalities—even Hong Kong—aren't just trying to break even; as powerful generators of commercial expansion, these megaprojects are potentially high-yield investments. Which is why the management and financing of new airport development is becoming increasingly privatized, particularly in the United States.—*David Simon Morton*



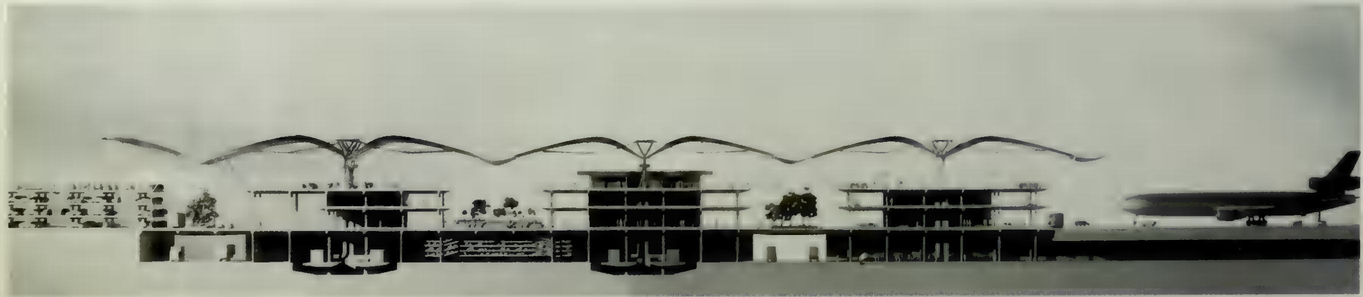
**Yong Dong Area International Airport, main terminal** Los Angeles–based Anthony Lumsden, FAIA, favors sectional organization over plan. It's a strategy suited to building types that anticipate expansion of working capacity, like this small airport in the northeast corner of South Korea. The cylindrical volumes of the 230,000-square-foot terminal correspond with function; the largest cylinder shapes the passenger meeting area. For increased capacity, the volumes can be extruded horizontally without interfering with one another. The resulting rolling forms, coated in metal rather than the glass most often specified for airport terminals, give the structure the smooth, precision look of jet engines and fuselages. To be completed in 2001. Architects: Anthony J. Lumsden & Associates and Jung-Il Architects.



**San Francisco International Airport, international terminal** This 1.5 million-square-foot terminal will be built over existing access roads, requiring the 866-foot-long roof to span, at its longest interval, 380 feet between columns. Inspired by the Firth of Forth bridge in Scotland, the roof is double-cantilevered, with bow-string trusses at the center. It is a structural form that maintains heavy loads and still achieves the illusion of lightness. Sunlight is screened through pixel-fritted glass on the west facade and diffused by glass sculptures—designed by James Carpenter—suspended beneath the skylights. All electrical lighting and HVAC are confined to the ticketing booths. Architects: Skidmore, Owings & Merrill/San Francisco—Craig W. Hartman, FAIA, design partner; Del Campo & Maru; Michael Willis and Associates.



**Miami International Airport, terminal expansion** Using forms as imprecise metaphors, such as undulating roof planes that can suggest wings, clouds, or waves, the architects sought to evoke "tropicality" without resorting to explicitly thematic design. The glass of the 2.1 million-square-foot terminal is tinted a deep green. Reaching above blue-hued terrazzo floors, the roof supports are abstract coral trees. Completion is set for 2005. Architects: Arquitectonica.



**Madrid-Barajas, new area terminal** This 3 million-square-foot terminal is also primarily organized in section, with each functional grouping separated by an atrium. The atriums bring light and "fingers of the red-earthed Spanish landscape" into large areas of the airport. In further defiance of the high-tech aesthetic of many airports, the architects hope to use wood and Spanish stone. The roof, with the repeated shape of a bird's wing, may be covered with photo-voltaic cells. Architects: Richard Rogers Partnership and Studio Lamela.

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## TEXAS SUMMER HEATING UP AS BIG NAMES BATTLE FOR COMMISSIONS

Along with bluebonnets and tornadoes, this is the season for competitions in Texas, with two museums up for grabs and an arena stirring controversy.

The Dallas Mavericks and the Dallas Stars have chosen Washington, D.C., architect David Schwarz to design their new $230 million home on an abandoned industrial site just north of downtown. The arena project was narrowly approved by Dallas voters in January, but the choice of Schwarz's historicist scheme (below) did little to heal the divisions. City officials praised the choice, while architects, including several of the competitors, offered harsh assessments of the selection process and the clients.

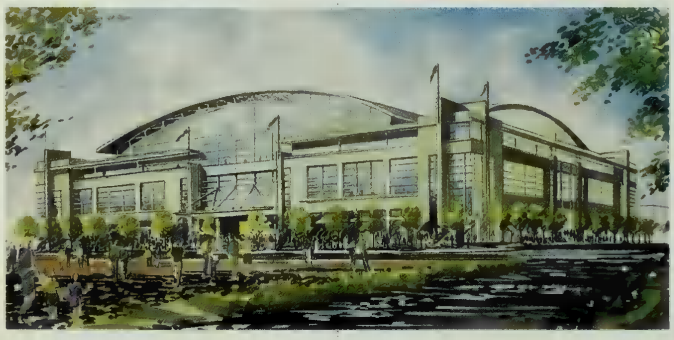
"It [was] clearly a 180-degree about-face," says William Pedersen of Kohn Pedersen Fox, which was a finalist. "They chose a sedate building, more like a historical train station than a 21st-century building. If that's what they wanted, they should have told us that up front."

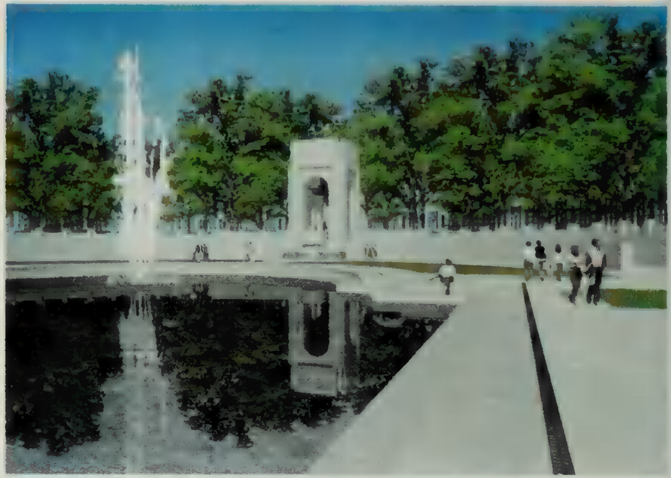
Mavericks owner Ross Perot Jr. called Schwarz's design "exactly right for the citizens of Dallas." The arena should open in late 2000.

The University of Texas's Jack S. Blanton Museum of Art has narrowed its search for an architect to design its addition to three: Antoine Predock Architect, Albuquerque; Herzog & de Meuron, Basel, Switzerland; and Steven Holl Architects, New York. The $35 million commission will be awarded this month.

Holl and Herzog & de Meuron made the short list in New York's Museum of Modern Art competition last year, while Predock has designed museums in Florida, New Mexico, Arizona, and California and has just won a competition to design the new Tacoma Art Museum building.

Across town, the Austin Museum of Art (formerly the Laguna Gloria Art Museum) is preparing a short list for a new downtown building. Robert Venturi won the commission in 1985, then ran afoul of local politics. The museum board decided to stage a new competition, with the results to be announced this summer. *David Dillon*





## COMMISSION HOLDS ITS FIRE AND APPROVES WORLD WAR II MEMORIAL

After being sent soundly back to the proverbial drawing board last July, Friedrich St. Florian's newly revised World War II Memorial has been approved in concept—though with specific points to be worked on— by the Commission of Fine Arts. The commission's chairman, J. Carter Brown, said in a statement that the group "unanimously and enthusiastically approves the site plan, location, and concept of the World War II Memorial as presented at its meeting today."

The statement reflects key criticisms surrounding the original design, unveiled in January 1997. Chosen through a competition, St. Florian's winning submission met with carping by the commission, whose support is vital to any project undertaken on the National Mall. It was also viewed with skepticism by many in both politics and the press. The proposed location, mid-axis between the Lincoln Memorial and the Washington Monument, was deemed inappropriate because it would have visually blocked the Mall's panorama, as well as curtailed circulation around the Reflecting Pool.

In addition, many critics felt that the scale was too large and that the memorial created an open plaza of questionable merit, surrounded by columns that didn't have an apparent reason for being.

While the commission did not bow to criticism of the choice of site, it did request that St. Florian respond to other concerns. As a result, the architect's revised design allows for open vistas and preserves the Mall's Rainbow Pool and surrounding elm trees. Granite arches are placed at the north and south ends, while arms made of stone and metal frame the interior memorial plaza. A ceremonial area at the western apex features a "torch of freedom."

The commission's statement of endorsement includes 14 design points—ranging from seating and lighting to landscaping—that need to be addressed in design development and presented yet again. The approval does mean, however, that the project moves a big step closer in the drawn-out process of inserting another memorial on the Mall. *Ellen Sands*

**DESIGNING IN THE CYBERSPACE AGE** **The new Getty Center in Los Angeles is certainly a tourist attraction, but it's also attempting to provide a home for meetings of the minds. To that end, a group gathered there last month to address how architecture is being affected by changes in technology and by the increased use of the Internet.**

**Participants in the symposium, called "Transarchitectures: Visions of Digital Communities," included artists, a technologist, and architects William Mitchell, Michael Benedikt, and David Jensen—a wide-ranging group that managed to draw several conclusions. The panelists declared that our experience of space can no longer be described using conventional architectural terms; that digital, Internet-based environments are now home to more activity than "real-time" communities; and that geographic boundaries have given way to networks tied together by common interests. It was decreed that alternative methods of design must arise from these truths. Although a cohesive strategy for how architecture can best adapt to the digital age was not proposed, the panelists did stress that architects shouldn't wait; now is the time to define and design our new spaces.** ***Alice Y. Kimm***

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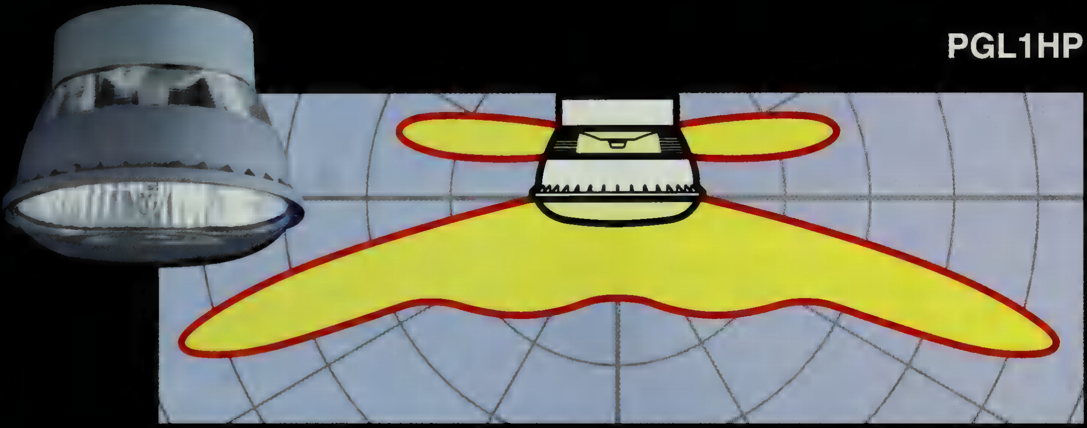

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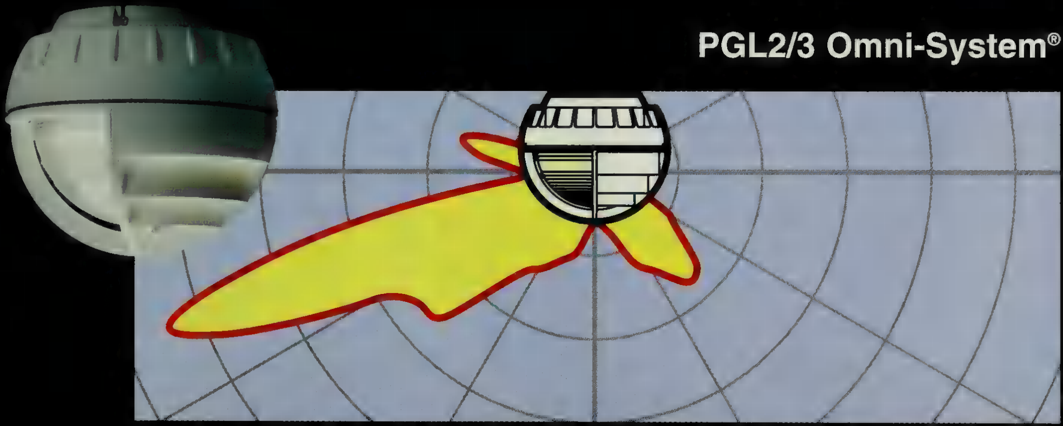

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CIRCLE 20 ON INQUIRY CARD

## MOUNT RUSHMORE'S CHISELED FACES GAZE DOWN ON NEW VISITOR COMPLEX

Sculptor Gutzon Borglum spent 14 years on Mount Rushmore National Memorial, in South Dakota's Black Hills, a project that was completed shortly after his death in 1941. Under his supervision, the presidential faces were chiseled into an outcropping of stately granite by workers using drills, dynamite, and jackhammers.

Since the 1950s, visitors to the park have been served by two main buildings, a visitor center and a cafeteria, but the buildings were designed to handle only about 1 million people a year; this year, nearly 3 million will visit the memorial. The National Park Service decided it was time for new facilities.

"This was a rare opportunity to remake an entire park," says superintendent Dan Wenk. He does admit, however, that some locals were sorry to see the old buildings leveled. "We tore down people's memories."

"Those buildings worked at one time, but ultimately they couldn't handle the crowds," says Ron Mason, FAIA, of Anderson Mason Dale, the Denver firm that was selected to design the new visitor complex. Mason used gray granite from Minnesota to create a series of structures, including a pergola, a concession building, an interpretive center and museum, a viewing terrace, and a 2,500-seat amphitheater.

"These are not frail or slight buildings," Mason says. "In that way, they connect with the strength of the monument, which has enormous integrity. Any architecture [connected to it] must have that same kind of dignity. That doesn't come about with buildings that are self-conscious. So our challenge was to see the buildings as servants to the sculpture, to be seen but in no way ever to compete with the mountain."

The project cost about $60 million, much of it raised by the nonprofit Mount Rushmore National Memorial Society. The new facilities are already completed but will be officially dedicated on August 25. Mary Ellis Borglum Vhay, Gutzon Borglum's daughter, will be there. "My father would have been thrilled with these new buildings," she says. "They're dignified, and they're beautiful." *David Hill*

## SAN FRANCISCO'S SCIENCE PROJECT: RENOVATING THE EXPLORATORIUM

The Exploratorium, the San Francisco science museum that has long since outgrown its hangarlike home at the Palace of Fine Arts, will soon be expanding and renovating.

The Exploratorium has occupied 160,000 square feet of the palace—originally designed by Bernard Maybeck as a temporary structure for the 1915 Panama Pacific Exhibition—since its founding in 1969. In 1993 the museum initiated a series of charrettes to develop a long-term vision; the resultant master plan, developed in consultation with Stastny Brun Architects of Portland, projected adding 50,000 square feet of exhibition space, expanding the workshops and administrative functions westward into the Presidio (a decommissioned army base recently added to the National Park system), and augmenting public amenities such as the restaurant.

It also calls for reorienting the entrance to bring the arc-shaped building into closer relationship with Maybeck's famed colonnade and rotunda—one of San Francisco's most beloved landmarks.

This year, Esherick Homsey Dodge and Davis (EHDD) prevailed over a field of local architects in an ideas competition, where firms described how they would implement the established master plan. According to jurors, the EHDD team, led by design principal Chuck Davis and project director Karen Fiene, showed a command over programming issues and had a long track record in designing museum and educational facilities.

EHHD's proposal (below, part of the interior) calls for restoring parts of the historic facade, connecting the existing site and the Presidio site with a pedestrian bridge, and linking the complex of four experimental theaters.

The jury hopes that EHDD's approach will provide a conceptual superstructure for the museum's often chaotic collection, without destroying its science-fair-meets-fun-house atmosphere. A campaign has been launched to raise the project's estimated $14 million construction cost. *Eric C.Y. Fang*

**ARCHITECTURE, NOT ARCHAEOLOGY** **Despite Italy's spectacular architectural history, few significant projects have been constructed there in the past three decades. Now Walter Veltroni, Italy's Vice Premier and Minister of Cultural Heritage, is seeking a remedy. Earlier this year Veltroni, along with Paolo Costa, the Minister of Public Works, held a meeting with 93 of Italy's best-known architects to discuss the situation and establish future priorities. Addressing issues of quality and the relationship between modern architecture and historic landscapes, Veltroni expressed a new outlook in a country where publicly funded building projects in the recent past have generally been treated as political patronage. He then nominated two National Landmarks Commissioners to develop and coordinate a series of concrete proposals.**

**In one instance of the new thinking, legislation requiring two-phase competitions is being considered for commissions of important public works. In Italy, where only about 10 national competitions are held per year (as opposed to 2,000 in France, according to Veltroni), this could help increase design quality. The founding of a museum and archives of 20th-century Italian architecture is also under study. Finally, the creation of an architecture branch within the Ministry for Cultural Heritage—which in the past has managed only the nation's historic patrimony—would strengthen the government's role not only in preservation but in planning the future of the built environment. Architect Vittorio Gregotti, after attending the meeting, stated that new architecture should be "a resource for the preservation of the constructed landscape and its growth. There is no conservation without appropriate development that has at its base a critical dialogue with the existing context."** ***Ilene Steingut***

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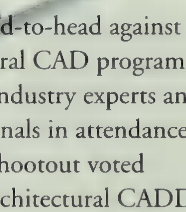

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| #5 | Arris | $4250 | #11 | BuildersCAD | $1995 |
| #6 | DataCAD | $249 | #12 | AutoCAD 14 | $7250 |

CIRCLE 21 ON INQUIRY CARD

## NEWS BRIEFS

**Lost and found** A competition drawing sketched in 1910 by Ludwig Mies van der Rohe and thought to be lost since the 1920s is now at the Museum of Modern Art. As it turns out, the drawing—done in hopes of a commission to build a monument in Germany—had been in the possession of the family of the architect's brother; it was among a group of works donated by various sources to MoMA's Department of Architecture and Design in April. Curators hadn't been alerted to its significance but soon realized what they had. "This extraordinary work will undoubtedly be a highlight of the Mies exhibition we have scheduled for the year 2000," said Terence Riley, Chief Curator of Architecture and Design.

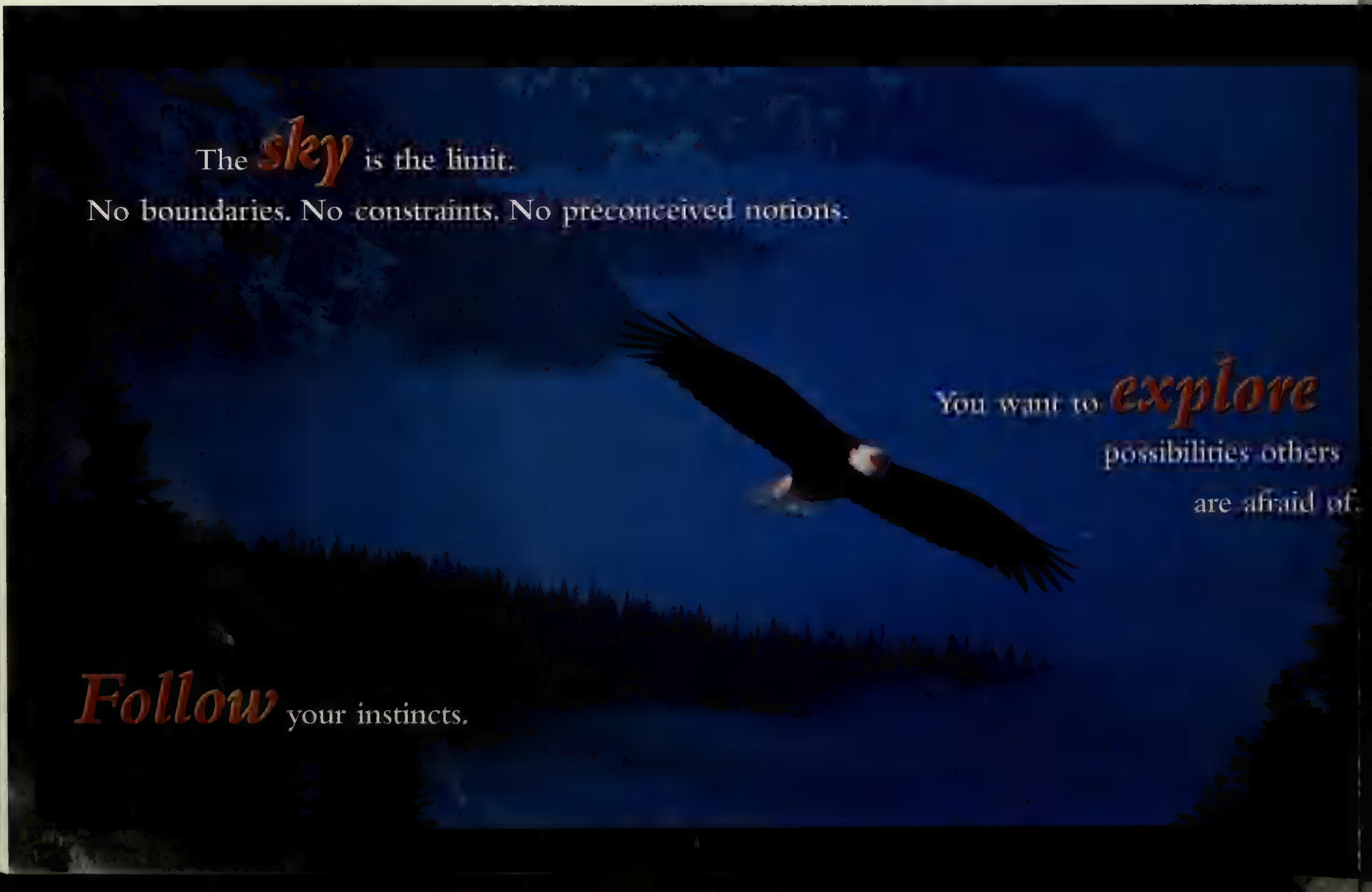
**A state of emergency near Detroit.**

**Designed by accident** Gunn Levine Associates knew the subject matter: accidents. So when it renovated the emergency department at North Oakland Medical Centers in Pontiac, Michigan, the firm used the idea of a collision—objects forcibly coming together and breaking apart. The collision portion of the building is embodied by a sculptural space, with fragments forming the triage, registration, and fast-track areas. According to the architects, the effect acts as a distraction, pushing aside thoughts of discomfort. Gunn Levine's work won the nonresidential category in the Gypsum Association's 1997 excellence awards.

**Florida in compliance** The U.S. Justice Department has certified that Florida's building code complies with federal accessibility requirements under the 1990 Americans with Disabilities Act. With the announcement, Florida joins Texas, Washington, and Maine as having their building codes deemed equivalent to ADA, and Justice officials are encouraging other states to follow suit. Architects, contractors, and owners who comply with a certified state code, such as Florida's, will gain added legal protection if they are sued under the ADA.

**On a roll** Antoine predock is loading up on commissions. The architect, based in Albuquerque and Los Angeles, has been selected to design a new $250 million baseball stadium for he San Diego Padres. He will work in association with Kansas City's HOK Sport, which is pretty busy itself—the firm is working on a design for the new Wembley Stadium in London, an 80,000-seat venue that will go up on the original stadium's site after its demolition. Construction will start in July 1999. In other stadium news, historic Lambeau Field in Wisconsin, home of the Green Bay Packers, is set to undergo extensive improvements and additions under the direction of Ellerbe Becket, whose sports architecture office is also based in Kansas City.

**Nordic giant** Seattle-based NBBJ, the fifth-largest architecture firm in the world, has won a competition to design the new headquarters of Norwegian telecommunications giant Telenor. The 2.75 million-square-foot project will be the largest office building in Scandinavia, housing 6,000 employees and consolidating 40 Telenor offices into a single complex in Oslo.



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**Monkey business** CLR of Philadelphia, a firm that specializes in zoo design, has agreed to pay $230,000 to the Vilas Zoo in Madison, Wisconsin, after disgruntled orangutans and chimpanzees caused damage by throwing rocks at windows and dismantling mesh over skylights. Zoo officials said the mesh should have been thicker and the soil free of rocks.

**New media** The Boston Society of Architects launched a quarterly magazine last month called *Architecture Boston*, with an eye on reaching more than just architects. The magazine is written "in an accessible, jargon-free style," according to the society, and targets anyone interested in the built environment.

**Glass acts** The 1998 DuPont Benedictus Awards, given annually to architects in recognition of the "significant and enterprising" use of laminated glass, have been announced. Jean-Marc Ibos and Myrto Vitart Architects of Paris won in the commercial projects category for the renovation of the Lille Fine Arts Museum in Lille, France. The work was praised for its innovative manipulations of the material's reflective qualities. Meanwhile, Aneta Bulant-Kamenova & Laus Wailzer Architekturstudio of Vienna took the prize for residences with its conversion and extension of the Sailer House in Salzburg, Austria. The architects were cited for their creation of an integrated space that flowed easily from the outside to the inside.

**Salzburg's Sailer House.**

**Gehry's Angels** A unique display of modern design is now in residence at the Solomon R. Guggenheim Museum in Manhattan. Through September 20, more than 100 motorcycles are featured in an installation devised by Frank O. Gehry, with the bikes placed strategically along the art-filled ramp of the Frank Lloyd Wright building. Gehry's exhibition design, using mostly industrial materials including rubber, raw lumber, and stainless steel, covers the outside parapet walls of the museum's rotunda with sheets of mirror-finish stainless steel. "The Art of the Motorcycle"—meant to recognize an American icon for its design and technical achievement—will travel to Chicago's Field Museum of Natural History in November, and on to the Guggenheim in Bilbao, Spain, in 1999.

**Stein honored** Karen Stein, Managing Senior Editor of ARCHITECTURAL RECORD, was given a special citation last month by the AIA New York Chapter for "distinguished work and service to the profession." Stein has been at RECORD for 14 years. ■

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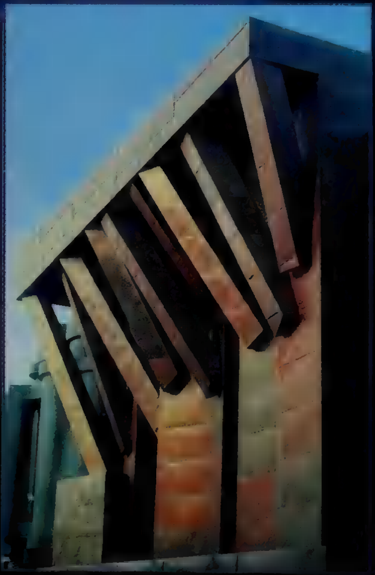

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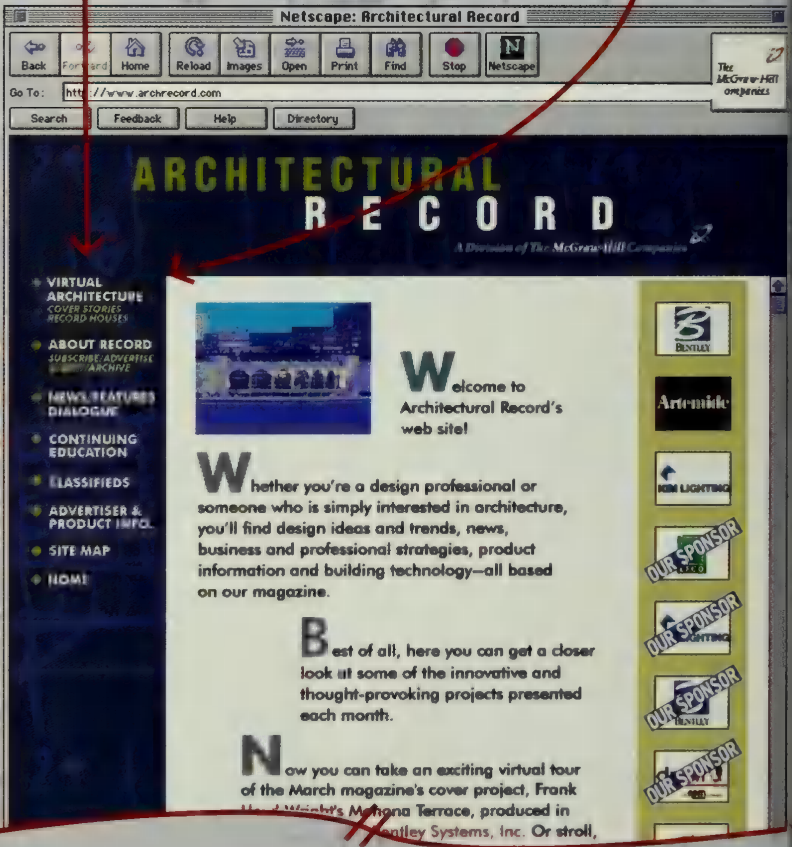

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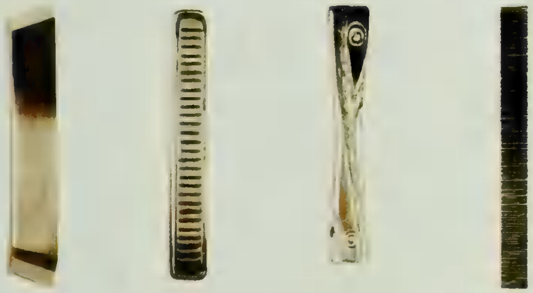

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# DATESEVENTS

## Calendar

**Changing Places: Looking at Southampton**
**Southampton, New York**
*Through July 12*
Paintings, maps, plans, and photographs document Southampton sites and how they have changed over time. The show explores issues of village planning, land use, historic preservation, and demographic change. Parrish Art Museum. 516/283-2118.

**The City as Memory: International Sculpture**
**Chicago**
*Through July 12*
Sculpture and other artworks created by artists from Europe, Asia, and North and South America. Chicago Athenaeum Museum of Architecture and Design. 312/251-0176.

**Architecture of Independence: Making of Modern South Asia**
**Pittsburgh**
*Through July 19*
The work of four South Asian architects—Charles Correa, Achyut Kanvinde, Balkrishna Doshi, and Muzharul Islam—is included in this traveling exhibition. Heinz Architectural Center, Carnegie Museum of Art. 412/622-3131.

**A New Campus Center: The IIT Competition Results**
**Chicago**
*Through July 25*
A show of materials submitted by the five finalists in the competition to build a new campus center for the academic complex designed largely by Mies van der Rohe. The exhibition includes work by Peter Eisenman, Zaha Hadid, Helmut Jahn, Kazuyo Sejima and Ryue Nishizawa, and Rem Koolhaas, who won the commission for the campus center. Art Institute of Chicago. 312/443-3600.

**American Architecture Awards**
**Chicago**
*Through August 16*
An exhibition of the 15 winners of this first annual installment of awards for new American projects. Chicago Athenaeum Museum of Architecture and Design. 312/251-0176.

**Landmarks of New York**
**New York City**
*Through August 23*
An exhibition of historical photographs marking the hundredth anniversary of New York City, accompanied by a symposium, walking tours, and panel discussions. New-York Historical Society. 212/873-3400.

**The Inflatable Moment: Pneumatics and Protest in '68**
**New York City**
*Through August 29*
An exhibition focusing on the French architects and activists Utopie. Also on display are models by Archigram, Frei Otto, Gernot Nalbach, and Coop Himmelblau, as well as structural fragments of built pneumatic projects. Architectural League of New York. 212/753-1722.

**Cities on the Move 2**
**Bordeaux, France**
*Through August 30*
This collaborative exhibition put together by artists, architects, filmmakers, and other "creators" explores the shapes and forms of Asian cities. Musée d'Art Contemporain. Call 011/33/05/56-52-78-36 or E-mail capc@mairie-bordeaux.fr for details.

**Forma Italia**
**Chicago**
*Through September 6*
An exhibition of Italian furniture, lighting, and industrial design from the permanent collection of the Chicago Athenaeum Museum of Architecture and Design, as well as several new pieces that were introduced in April at Milan's Salone del Mobile. Chicago Athenaeum Museum. 312/251-0176.

**The Architecture of Graham, Anderson, Probst & White**
**Chicago**
*Through September 6*
On exhibit is the work of this venerable Chicago firm, a leader in the development of "commercial classicism." The projects on view, from 1912 to 1936, include such landmarks as the Merchandise Mart, the Civic Opera House, the Wrigley Building, Chicago Union Station, and the Shedd Aquarium. Chicago Architecture Foundation. 312/922-3432.

**Japan 2000: Design for the Japanese Public**
**Chicago**
*Through September 7*
An exhibition of recent winners of Japan's G-Mark, an annual awards program sponsored by the government, which promotes good design. On display are such winning products as Casio G-Shock watches, Yamaha bicycles, and mini automobiles. Art Institute of Chicago. 312/443-3600.

**National Design Triennial**
**New York City**
*Through September 12*
A survey of developments in contemporary design, investigating how issues and ideas drive design practices in America. Cooper-Hewitt National Design Museum. 212/849-8300.

**Completing the Federal Triangle**
**Washington, D.C.**
*Through September 27*
An exhibition documenting the development of the Ronald Reagan Building and International Trade Center on Pennsylvania Avenue, starting from a design competition in 1989 and culminating with the building's recent completion. The winning design was by Pei Cobb Freed & Partners in association with Ellerbe Becket (see article beginning on page 58). National Building Museum. 202/272-2448.

**Shifting Gears: In Pursuit of a Greener City**
**Toronto**
*Through September 27*
An exhibition proposing urban design strategies for reducing carbon dioxide emissions. Design Exchange. 416/216-2145.

**Fountains: Splash and Spectacle**
**New York City**
*Through October 11*
This exhibition elucidates the role of European and American fountains—and water as a design force—in defining urban space, with examples ranging from the Renaissance to the present. Cooper-Hewitt National Design Museum. 212/849-8300.

**Frank Lloyd Wright and the Living City**
**Weil am Rhein, Germany**
*Through October 11*
An exhibition of Wright's schemes for Broadacre City, which attempted to erase the dichotomy between city and country. This is the most comprehensive exhibition in Europe of Wright's work to date. Vitra Design Museum. For more information, call 011/49/7621/702-33-51 or visit www.design-museum.de.

**The Design and Building of Girard College**
**Philadelphia**
*Through October 23*
Surviving entries in the 1832 design competition for the college, the first architecture competition to attract nationwide attention, will be on display, as well as drawings of the construction of the winning entry, completed in 1848. Founder's Hall. 215/787-2601.

**Under the Sun: An Outdoor Exhibition of Light**
**New York City**
*Through October 25*
An exhibition of solar-powered installations, including commercial products, experimental prototypes,

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and commissioned designs. Cooper-Hewitt National Design Museum. 212/849-8300.

**New Ways of Revitalizing the American City**
**Washington, D.C.**
*Through January 3, 1999*
An exhibition illustrating how new cultural facilities have enlivened tired downtowns in Phoenix; Cincinnati; Fort Worth; Newark, New Jersey; San Jose, California; and Kansas City, Missouri. National Building Museum. 202/272-2448.

**Bechtel's First Century**
**Washington, D.C.**
*Through January 4, 1999*
A portfolio of projects by the San Francisco–based Bechtel Group, one of the world's largest engineering and construction firms. Highlighted "megaprojects" include the Hoover Dam, the Marinship shipyard, San Francisco's rapid transit system, and the Channel Tunnel. National Building Museum. 202/272-2448.

**Tony Smith Retrospective**
**New York City**
*July 2–September 22*
Works by the architect and artist, who trained under Frank Lloyd Wright and designed houses before turning to painting and sculpture. Several of Smith's monumental sculptural works will be installed at public sites throughout Manhattan. Museum of Modern Art. 212/708-9400.

**Do Normal: Recent Dutch Design**
**San Francisco**
*July 17–October 20*
This exhibition of works by Dutch designers focuses on the centuries-old design consciousness that pervades every aspect of the country's culture. San Francisco Museum of Modern Art. 415/357-4000.

**Toward Tomorrow Festival**
**Westfield, Massachusetts**
*July 23–26*
A festival combining the Quality Building Conference, showcasing energy-efficient construction; the Timber Framers Guild of North America's eastern conference; Renew '98, focusing on market successes with renewable energy; and the Solar-Powered Music and Educational Festival. Call 413/774-6051 or visit www.nesea.org for details.

**National Society of Professional Engineers Annual Convention**
**Tulsa**
*July 23–28*
This year's convention features "professional edge" sessions, practice committee meetings, and the engineering expo of new products and services. So what's different? Astronaut Shannon Lucid will be in attendance. Register on-line at www.nspe.org or call 703/684-2849.

**Robert Adam: The Creative Mind**
**Washington, D.C.**
*July 24–January 3, 1999*
An exhibition of the work of the 18th-century Scottish architect, demonstrating the process of design from conception to final presentation. The Octagon. 202/638-3105

**alt.office Conference and Expo**
**San Jose, California**
*August 12–14*
The premier national event focusing on alternative work processes from the combined perspective of people, technology, and the environment. Among the speakers at general sessions will be Kevin Kelly of *Wired* magazine and William McDonough, dean of the University of Virginia School of Architecture and a practitioner of sustainable design. McEnery Convention Center. For more information, visit www.altoffice.com.

**DOCOMOMO Conference**
**Stockholm**
*September 16–18*
This year's conference of the International Working Party for the Documentation and Conservation of Buildings, Sites, and Neighborhoods of the Modern Movement focuses on the social aspects of modern architecture and urban planning. An international docket of speakers will be presenting papers. Swedish Museum of Architecture. E-mail marina.botta@arkitekturmuseet.se for more information.

## Competitions

**Religious Art and Architecture Design Awards**
*Submission deadline: July 24*
*Faith & Form* magazine and the Interfaith Forum on Religion, Art, and Architecture are sponsoring three competitions under the categories of religious architecture, liturgical/interior design, and religious arts. Projects must have been completed since January 1, 1993. Contact *Faith & Form* at 919/489-3359 for an entry form.

**Interpane Glass Scholarship**
*Submission deadline: July 31*
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*(continued on page 135)*

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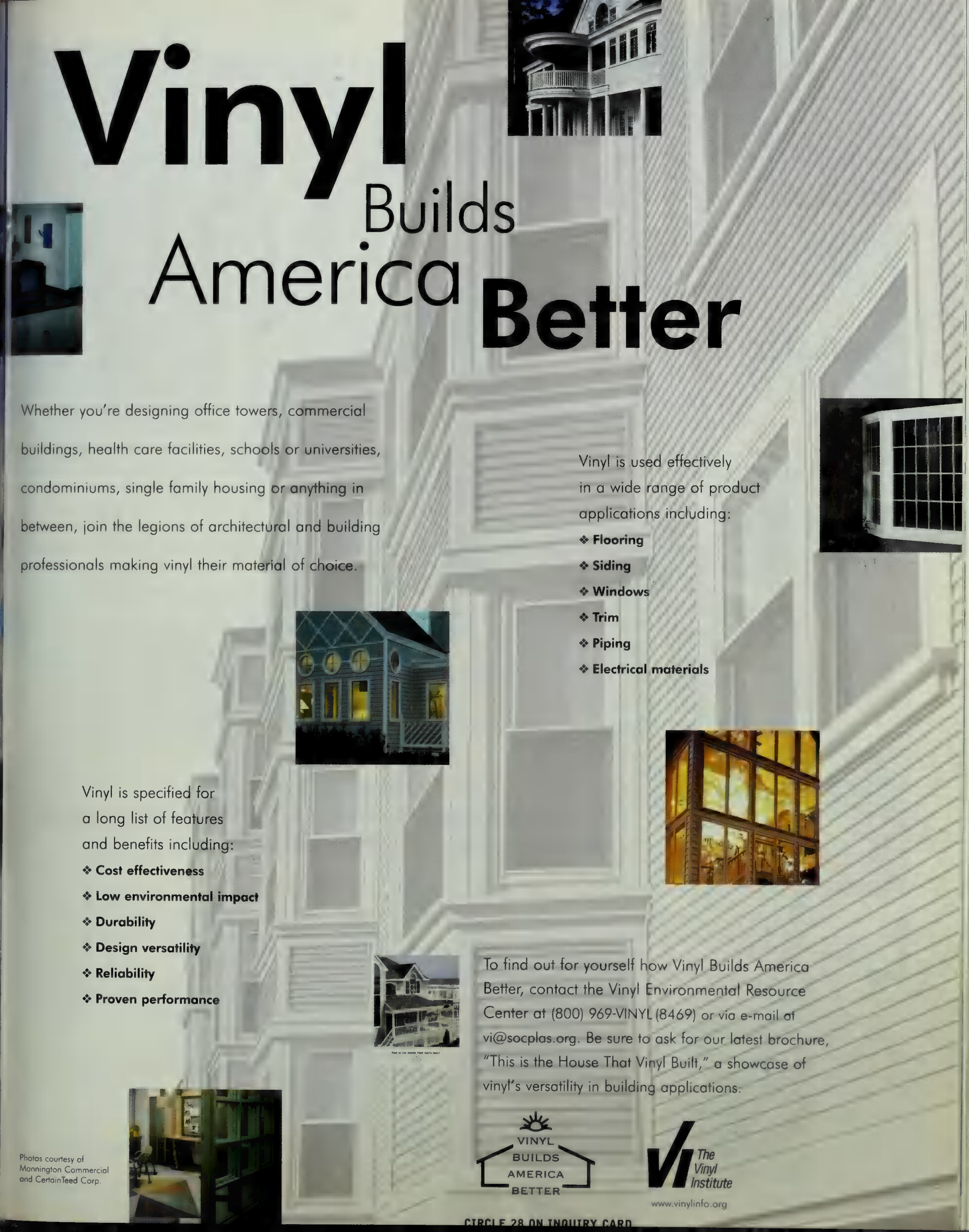

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CIRCLE 28 ON INQUIRY CARD

# LISTENING TO: Clients

## WHAT DO THEY THINK OF ARCHITECTS?

**by Andrea Oppenheimer Dean**

*Perhaps nothing affects an architect's career more profoundly or is more deeply irritating to a client than the inability to achieve mutual trust. For the client it results in unnecessary design and construction problems; for the designer it can spell failure.*

*Maybe that is why the roundtable of architectural clients convened by* ARCHITECTURAL RECORD *last April in Atlanta kept spiraling back to issues surrounding the client-architect relationship: How has it changed in recent years? What are the most valuable abilities the architect can bring to it? What are the most frequent causes for its rough periods and breakdowns? How can it be improved? One of the panel's most striking revelations was that clients in all sectors of the economy are increasingly hiring in-house architects to plan, manage, and coordinate their building efforts. For many architects this has meant changed expectations on the clients' part, in terms of the services they need and the manner in which they want them carried out.*

*In fact, four of the 10 client panelists were also architects: Daniel Sniff (4 in photos opposite), director of planning, University of Georgia; J. Bradley Satterfield (9), AIA, director of campus architecture, Georgia Institute of Technology; Charles Andrews (5), assistant vice president for space planning and construction, Emory University; and Ken Gwinner, AIA (3), vice president for planning, architecture, and construction, Turner Broadcasting. Also representing the corporate sector was Joyce LaValle, president and CEO of Prince Street Technologies (10), in Cartersville, Georgia. Two Atlanta developers participated: Grant Grimes (2), president of the real estate company Ackerman & Co., and Earnest M. Curtis III (7), vice president of Carter Healthcare Facilities. There were also three government clients: John R. Butler Jr. (11), acting director of the construction division of the Georgia State Financing and Investment Commission; Carol J. Stewart (8), director of library services for Clayton County, Georgia; and Charles Pete Wood (6), a councilman from Smyrna, Georgia. The panel was moderated by Robert Ivy (1), FAIA, editor-in-chief of* RECORD.

**ACCORDING TO OUR PANEL, CLIENTS IN ALL SECTORS OF THE ECONOMY ARE INCREASINGLY HIRING IN-HOUSE ARCHITECTS TO COORDINATE THEIR BUILDING EFFORTS.**

Let's begin with the good news: Joyce LaValle, for one, confirmed that architects can benefit their clients in unexpected ways. She recounted taking the helm at Prince Street Technologies in 1995, when the floor-coverings manufacturer was, she said, "in deep trouble." After acquainting themselves with every aspect of the business and its problems, the Atlanta firm of Thompson Ventulett and Stainback (TVS) helped LaValle reevaluate her company and forge a more productive marketing strategy. TVS architects persuaded her, she said, to create a new building that would exhibit the company's products and its benevolent attitude as an employer. As evidence of Prince Street's egalitarianism, the architects created a fully open office plan that brings views of the outdoors and natural light even to the least prestigious clerk and makes manufacturing spaces visible from the office area [see RECORD, December 1996, page 44]. The message, said LaValle, is that "we're all in this together; there is respect for everyone." The architects also persuaded LaValle to incorporate "environmentally responsible" features, and they convinced her to redirect advertising dollars to bring prospective customers to see the building. Her experience with TVS, LaValle said, made her "a strong advocate of the idea that how [good] the building is often reflects how [good] the business is" and showed her that "really good architects can bring benefits you never expected."

Equally enthusiastic, though for different reasons, was Carol Stewart, Clayton County's Director of Library Services. When she selected Atlanta's Scogin Elam and Bray Architects to design the first of three new county libraries in 1985, Stewart was an inexperienced client and only 36

*Andrea Oppenheimer Dean (12 in photos opposite) is a contributing editor of* ARCHITECTURAL RECORD *and is based in Washington, D.C.*

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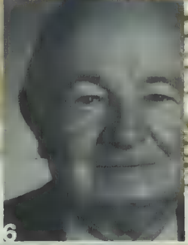

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"WHEN THE ARCHITECT STOPS LISTENING, IT ALL BEGINS TO CRASH AND BURN."

**—Daniel Sniff**

years old, but she had strong convictions about design. Maybe it was growing up near the Frank Lloyd Wright–designed Florida Southern University, she said, that convinced her she wanted "something unique and wonderful." She is certain, 15 years later, that Clayton County's award-winning libraries have lifted the predominantly blue-collar citizenry's opinion of libraries and of itself [RECORD, May 1992, page 86].

The University of Georgia's Daniel Sniff recounted a range of experiences. He credited Ayers/Gross/St. John of Baltimore, which created and implemented a new master plan for his university, with challenging him and his staff to redirect their thinking about campus planning and design "to where the emphasis is on memorable people spaces." But Sniff faulted other architects for their deaf ear to clients' needs and their arrogance. No complaint was echoed more frequently during the morning's proceedings or in follow-up telephone conversations. "We know our systems and our campus and our infrastructure, but for some reason architects don't believe us," said Emory University's Charles Andrews. "When the architect stops listening and begins to think that he knows more than we do about laboratory design, for example, it all begins to crash and burn."

Another frequent source of frustration, said John Butler, who heads the construction division of Georgia's State Financing and Investment Commission, is with "constructibility problems." He testified to buildings in which "the actual details don't go together" and lamented that too few designers have up-to-date knowledge about materials. Many architects don't realize, he said, "that today's concrete block is a different material than it was 10 years ago." What he needs, he continued, and gets too infrequently is architects who are able and willing to answer his questions quickly and completely and can make decisions rapidly. Too often, he said, architects "just defend their position, defending, defending, defending, until all of a sudden it's too late to easily correct the problem."

Also singled out was specifications writing. When asked about its importance, whether it remains the job of architects, and how well they carry it out, the panelists agreed: specs are vital and architects are usually in charge, but many do the job carelessly and incompletely. Several clients complained of being presented with boilerplate rather than specifications tailored to the particular project.

Similarly problematic, said Butler, is a tendency among architects to install systems that are up-to-the-minute but too complex for his operations and maintenance staff. Stewart related how her relatively unsophisticated county maintenance people "simply tore new-fangled electronic thermostats off new library buildings. You put some high-tech gizmo on a building, and your staff says, 'Wot is thayat,'" the library director drawled. By the time she began work on Clayton County's third new library, she insisted that the workers charged with the building's upkeep approve its systems before installation. "The level of technology should not exceed the ability of the building's caretakers to deal with them," she concluded.

Ken Gwinner, frustrated with architects who don't know his company well enough and are unwilling to take responsibility for their decisions and for completing projects on time and on budget, says he has "brought more and more people in-house who have the capabilities we need. We now tend to think of the outside architect as one of the players, but not *the* player." Gwinner explained that he, as an architect, and his staff do a lot of planning and feasibility studies. "Only when the time is right do we bring in the architect," he said. "That's certainly not the way it used to be, but I think a lot of corporations moved to this method because they weren't getting what they needed. When you hire architects who work for the company, they [need to] know what the corporation's perspective and culture is."

Carter Healthcare's Earnest Curtis, who also has an in-house staff, insisted that "most architects are not close enough to the specific market to be able to fully interpret it or have never been in a position to be helpfully accountable. Owners and users are always accountable for the end product." Like Turner Broadcasting and Carter Healthcare, which employ architects who serve as clients, Prince Street has recently hired an in-house designer. The majority of employees who deal with construction at Ackerman & Co. have an architectural background, according to Grant Grimes. At Georgia Tech, reported J. Bradley Satterfield, because funding and contracting requirements necessitate separating design and construction services, an in-house professional group has assumed the role of coordinator. And when Butler was asked whether he relies on architecture firms to coordinate state construction projects, he replied, "definitely not." In fact, nearly all the panelists reported taking an increasingly active role in design and construction.

Surprisingly, perhaps, corporations' and institutions' use of in-house architects can depress architects' fees. Grimes pointed out that when architects are brought in to function as clients, "they're going to do everything to bring down the fees of the outside firm. It's a competitive thing," he said. "They figure, 'I'll do the conceptual work, and I'll only need the outside firm to draft the documents.'" Yet all the panelists agreed that architects are underpaid but held out little hope for a significant change. Because architects have a low opinion of the services they provide, "we don't value their services enough," said Satterfield. When architects are willing to accept low fees, that's what they get, he said. Together with other panelists, he urged designers to begin fee negotiations early rather than saving their protests until late in the job. Butler told how the State of Georgia is trying to provide more equitable compensation by replacing the standard percentage of costs with a lump sum settlement, arrived at through negotiations that begin by establishing a percentage of costs.

What capabilities or qualities do clients who have in-house architects value most in the architectural firms they hire? LaValle, Sniff, and Gwinner stressed how important it is for the architects they commission to thoroughly familiarize themselves with the client's company. Listen to us, Andrews emphasized. Satterfield elaborated, "It all begins with good programming, during which you form an ethic of dialogue." Several clients reported that they are increasingly using outside architects in new roles. Satterfield, for example, described having asked a designer "to come in and look at the economic feasibility and the program, show us two or three options, and lobby various constituencies for approval." At other times he expected an architect to meet with Georgia Tech's

"HOW GOOD THE BUILDING IS OFTEN REFLECTS HOW GOOD THE BUSINESS IS."

**—Joyce LaValle**

president or senior executives and "bring an objective eye to such highly political decisions as siting a building." In LaValle's opinion it makes perfect sense for a profession that is trained in problem-solving techniques to assume such new roles as figuring out new business strategies for a client.

But the architect's trump card is the ability to design, and several panelists remarked on the magical transformation of a blank sheet of paper into architecture. "That's a pretty phenomenal accomplishment; there are so many variables," said Satterfield. How important did these clients consider design to be? Surveys made by his university, said Sniff, show that the look and feel of a campus and its grounds ranks fourth among reasons given by students for choosing a college or university. "Aesthetics," he said, "are very important." Butler said his office was prohibited from approving designs that fail to blend with their surroundings, and Grimes explained that his real estate company insists on buildings also "adding something that raises the standard." Both Butler and Stewart, however, mentioned the public's misconstrued view that if it looks good, it must be too expensive. "Good design," insisted Sniff, "is not driven by dollars and cents." As examples he cited Clayton County's libraries, which were built for $68 per square foot.

**"WE DON'T VALUE THE SERVICES OF ARCHITECTS ENOUGH."**

***—J. Bradley Satterfield***

What about the hiring process? How do these clients acquire their architects? "Doing health-care facilities, nine times out of 10, we deal with an architect we've worked with before," said Curtis. If he hires a new firm he insists that it affiliate with a more experienced one. None of the panelists recommended or used a fee-based selection process. "It doesn't work," said Curtis. Sniff too hires on the basis of qualifications but likes to have a broad knowledge about designers he's considering, "because their having done 10 buildings just like ours doesn't mean we'll give them the job." Before making a decision, he calls former clients to ask whether the firm carried out its work on budget and on schedule, whether it solved the client's problems, whether it solved them in an innovative way, and whether the architects were good listeners. Andrews told of similarly making selections based on a review of qualifications and recommendations, of proceeding from a long list to a short list and then to interviews. In most cases, Andrews said, he prefers local architects, as do most of the panelists; they hire national firms only if the firms have a local office. "To a large extent the architects are our technical eyes and ears to find out what's been drawn and agreed to and what's being built," said Grimes. "It doesn't work if they come from out of town."

And although large firms are winning an increasingly large share of architectural commissions nationwide, the Atlanta-area clients reported hiring firms of every size, using smaller firms, for instance, for renovations, interiors, and showrooms. More important than size, said several panelists, is a firm's ability to respond quickly and well and to provide continuous service. They agreed that, in most cases, the larger the firm, the less chance that a principal will be involved—which all of the panelists considered important—and the higher the odds of having more than one project architect over the life of a long project. "That's a distinct disadvantage to us," said Sniff, who has found that as management turnover increases, so does the number of legal problems.

The advantages to the client of having the uninterrupted attention of a single architectural firm were underscored by Pete Wood, the city councilman from Smyrna. In 1985 the town of 35,000 set out to build a new downtown and hired Sizemore Floyd Architects, Inc. of Atlanta to create a master plan and implement it in phases, completing a community center, a library, and a village green in 1991, a city hall and municipal court building in 1996, and a police facility in 1997. Unlike most of the other Atlanta-area clients, the city counted on the architect for construction supervision. "They've been there, they've been consistent, and they've kept us informed. We've counted on them to tell us what the problem areas are and where we are on budget," Wood said. He relied on his architects' ability to work with a variety of committees and with neighborhood, special interest, and nonprofit organizations, and he was especially pleased when the designers went beyond their traditional duties. For instance, he said, they represented the city in meetings with private downtown developers to make sure their designs were suitable, and they undertook a search for retailers "who would be compatible with a pedestrian-friendly, family-oriented downtown."

When the panelists were asked how many of them relied on a traditional design-bid-build method, six raised their hands. Among those using alternative approaches was Curtis, whose company brings the contractor in as part of the design discussion to "find ways to reduce design costs." He was not alone in preferring fast-track or design-build because it's "more owner-involved and more of a team approach."

Paradoxically, although a majority of the Atlanta panelists stressed that architects' roles and responsibilities are shrinking, the most enthusiastic clients were those who relied fully on their architect to design and deliver all aspects of a project: Pete Wood; Carol Stewart, for whom Scogin Elam and Bray designed all three Clayton County libraries; and Joyce LaValle, for whom TVS created Prince Street's headquarters and a plant. In the end, all the participants agreed that architects should supervise construction and that "if they want to continue in the profession and keep their reputation, they have got to accept some responsibility for what they do," as Butler said. That doesn't eliminate the need for an owner's representative on site, pointed out corporate clients Earnest Curtis and Ken Gwinner, both of whom are convinced that only an insider will have the information and authority to make rapid, credible decisions.

**"DO WHAT YOU DO BEST. FOCUS ON YOUR CORE COMPETENCIES."**

***—Earnest M. Curtis III***

A final question to the panel: Was there a message that they wanted to impress upon the architectural profession? There were several. "Do what you do best. Focus on your core competencies of programming, design, and construction," counseled Curtis. "Get things set up with everyone working as a team up front during programming and be receptive to ideas that may not include the latest widget," said Grimes. LaValle stressed that "every other industry in America" has gone through a process of reevaluating and revamping the way they do business: "I wonder if the construction process doesn't have to be taken apart and put back together again, rethought altogether." In the end, Andrews spoke for everyone when he said, "Listen. Listen. Listen better. Understand the client's culture. Get immersed in what we do, who we are." ■

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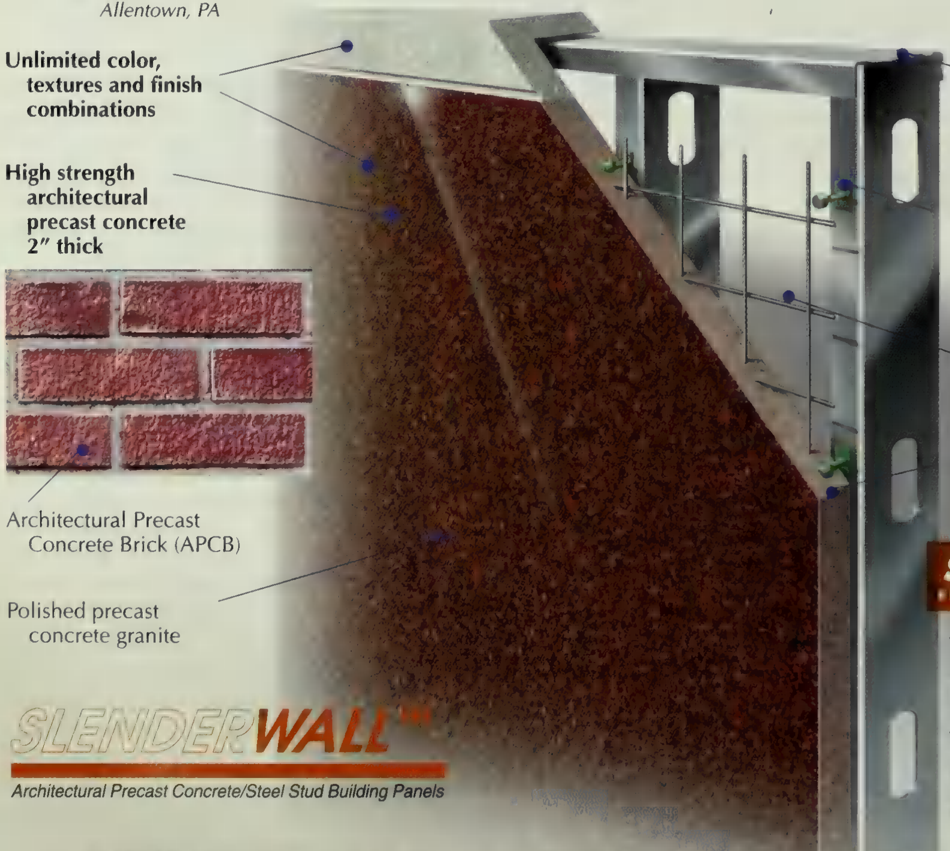

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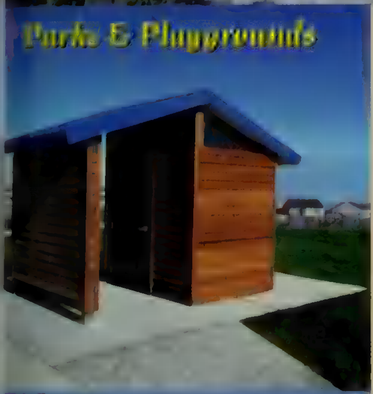

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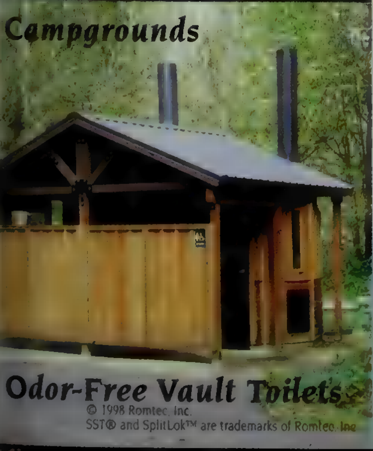

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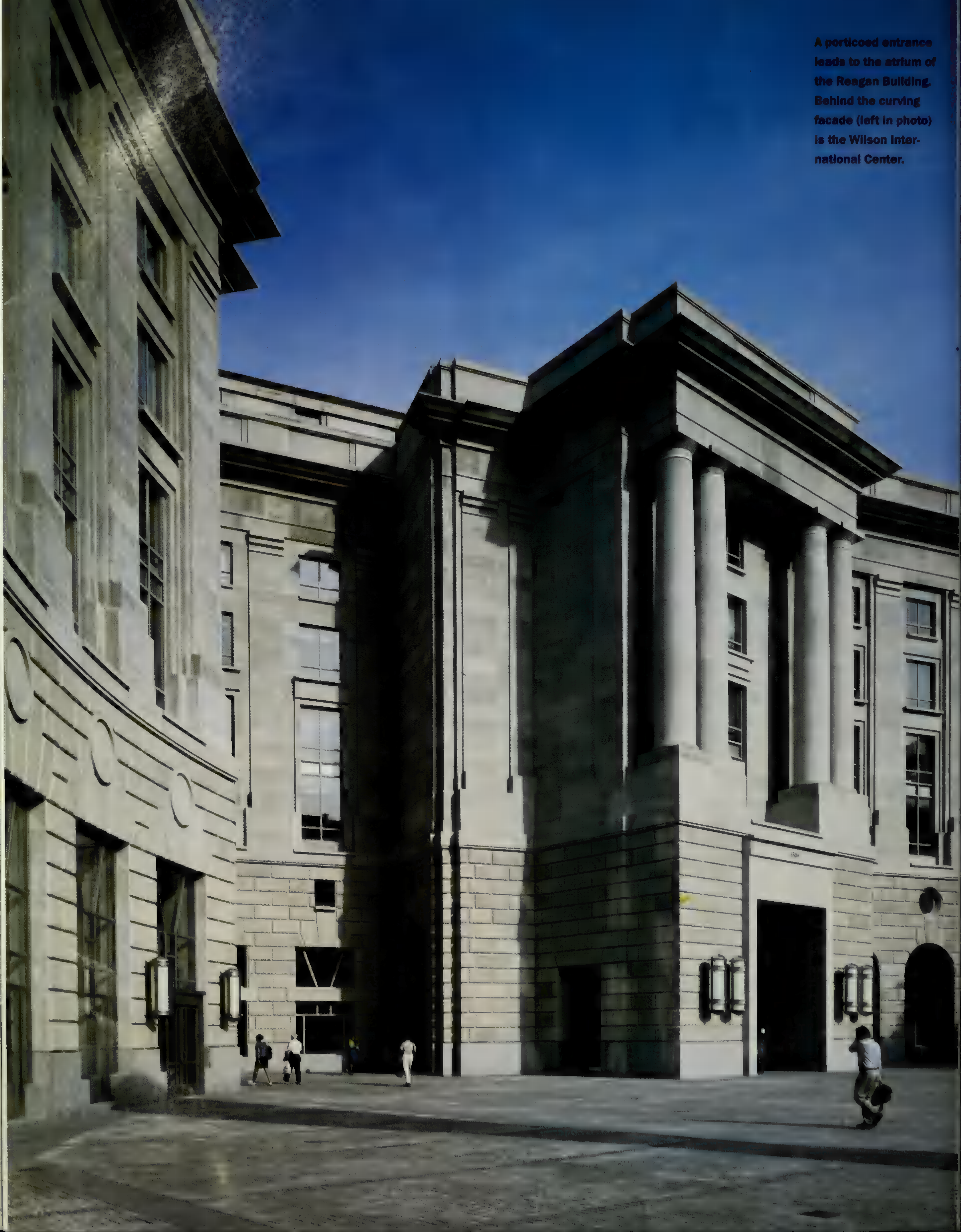
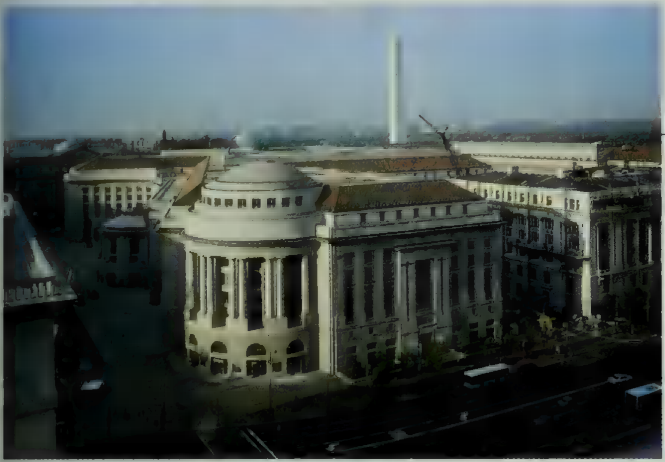


A porticoed entrance leads to the atrium of the Reagan Building. Behind the curving facade (left in photo) is the Wilson International Center.

# PROJECT DIARY: After 11 years of struggle, the RONALD REAGAN BUILDING offers lessons in working with multiple clients and design/build.

**by James S. Russell, AIA**



A rotunda marks the 90-degree angle made to recognize the diagonal of Pennsylvania Avenue (foreground).

James Freed is neither a Postmodernist nor a historicist. Best known for such muscular modern buildings as the Los Angeles convention center and Boston's John Hancock Place, Freed, a partner at Pei Cobb Freed & Partners, has found himself in the anomalous position of reinterpreting Washington, D.C.'s legacy of Beaux Arts Classicism on two of the city's key sites. The first was the U.S. Holocaust Memorial Museum [RECORD, July 1993, page 57], which proved a triumph. The jury is still out on the second, the Ronald Reagan Building and International Trade Center, which opened in early May.

The Reagan Building's inception in the 1980s coincided with a nationwide debate on the role of government. The project became a lightning rod: Detractors saw it as a temple to big government and a tax-and-spend boondoggle. Advocates saw it as a model of efficient procurement and innovative public/private partnership. That these competing visions never came to terms was key to the building's tortuous 11-year gestation, with delay-driven costs that are still the subject of debate.

### A 1980s-style marriage of convenience

After decades of failed attempts, the 1980s brought successful revitalization to the north side of Pennsylvania Avenue. America could again be proud of the nation's formerly tattered Main Street. So the late 1980s seemed an auspicious moment to consider completion of the Federal Triangle, the nexus of governmental Washington, on the south side of the avenue. Designed by such blue-chip firms as John Russell Pope; Zantzinger, Borie, and Medary; and Delano and Aldrich, the 12-building Federal Triangle formed the most fully realized collection of Beaux Arts structures in Washington. Most of them were built between 1927 and 1938 as massive pedimented and pilastered limestone edifices housing various federal agencies. An 11-acre gap, long used as a parking lot, remained within this 70-acre assemblage. Only a fountain stood as a vestige of the grand formal plaza planned in the 1920s for the site.

By 1987 an unlikely alliance had formed to complete the Federal Triangle. The site appealed to Kenneth R. Sparks, a key figure in the Federal City Council, a powerful civic group, who thought the city needed an international trade center to spur private-sector growth in Washington by increasing its international presence and visibility. Terence C. Golden, then administrator of the General Services Administration, thought that federal agencies were scattered over too many locations and paying too much rent. Senator Daniel Patrick Moynihan got involved because he believed that an inviting civic building could encourage further redevelopment in the area. The men envisioned the Federal Triangle Project, as it was called then, to include an international trade center with spaces for exhibits, restaurants, and banquets; several performing arts venues to expose Washingtonians to culture from the world over and to attract after-dark use to downtown; and 1.1 million square feet of office space for consolidating government agencies.

In approving the project in 1987, Congress put it under the auspices of the semiprivate Pennsylvania Avenue Development Corporation

**WWW On The Web:** *Take a virtual tour of this project at www.archrecord.com.*

**Project:** *Ronald Reagan Building and International Trade Center, Washington, D.C.*

**Architects:** *Pei Cobb Freed & Partners Architects/Ellerbe Becket Architects & Engineers—James Ingo Freed, FAIA, Werner Wandelmaier, FAIA, Michael Flynn, AIA, Craig Dumas, AIA, Beatrice Lehman, AIA, Charles Young, AIA, Roy Barris, AIA, Alissa Bucher, AIA, David Tobin, AIA, Steven Derasmo, Michael Vissichelli, AIA, Ivan Kreitman, AIA, Richard Smith, Anne Lewison, AIA (Pei Cobb Freed); Rick Lincicome, AIA, W. Everett Medling, AIA, John Moyer, AIA, Kathleen Alberding, Bradford Cary, Christopher Sasiadek, Darrell Acree, Margaret Flinner, AIA, Charles Franklin, Tony Ramis, Darwin Larson, Ron Runnion (Ellerbe Becket)*

**Engineers:** *Weiskopf & Pickworth (structural); Ellerbe Becket (MEP)*

**Consultants:** *Fisher Marantz Renfro Stone (lighting); Benjamin Thompson & Associates and Greenwell Goetz (trade center interiors)*

**Construction Manager:** *Perini Corp.*

1300

The diagonal of the east elevation (middle) is interrupted by a rotunda and culminates in a plaza (left) that extends the Rios Building's hemicycle. Freed made the long 14th Street elevation (bottom) concave but peeled away the edges to make it less formidable. The rusticated base and tripartite facade help disguise the nine floors.

(PADC), with the General Services Administration (GSA) and the newly formed International Cultural and Trade Center Commission (ICTC) as partners. The project team was to be selected by a qualifications process and a design/build competition. Each team would include a developer (to manage the project and front the money for it), a set of designers, and a construction manager. In 1989, Pei Cobb Freed was asked to join a team put together by the Delta Group developers, which included people with whom Freed had worked on the Holocaust Memorial. Pei Cobb Freed would be design architect, while Ellerbe Becket would handle most of the construction documents and construction-phase work. The lead architects for the other teams were Kohn Pedersen Fox; Skidmore, Owings & Merrill; Michael Graves; Hellmuth, Obata & Kassabuam; Harry Weese and Associates; and Hardy Holzman Pfeiffer Associates.

As competing teams looked over the request for proposals, they might have noticed that the project involved three separate programs, each huge, complex, and little fleshed-out; that the client was three-headed; and that public-private design/build project delivery had no precedent for a project of such complexity. If Freed had doubts about the process, they were overcome by the appealing program, with its "energetic, exciting, and inventive" mix of functions and urbanistic potential.

### Devising a design approach

Freed began by analyzing the intimidating site, an awkward L shape. The surrounding buildings were not only massive, they had been finished in an era when full-thickness, carved-limestone walls could be built for a relative song. Their consistent cornice lines asked to be extended; the enormous neoclassical hemicycle of the adjacent Ariel Rios Building demanded completion. And Congress had made clear what it wanted: a project that "should represent the dignity and stability of the federal government" and "reflect the symbolic importance and historic character of Pennsylvania Avenue and the nation's capital." Freed's inclination, however, was not to replicate the existing buildings' monumental detailing: "It would have looked fake to me, out of our time," he explains. A fully modern building, on the other hand—a contrasting rather than contextual approach—would have, he says, "smashed" the consistent unity that was the Triangle assemblage's primary strength. *(text continues)*

**FREED DIDN'T WANT A BUILDING THAT WOULD LOOK FAKE, "OUT OF OUR TIME."**

# THE LONG AND WINDING ROAD TO FINISH THE FEDERAL TRIANGLE

## 1920s

The District of Columbia's Fine Arts Commission is asked to develop a plan to provide badly needed office space for several federal agencies on a triangular tract south of Pennsylvania Avenue and east of the Ellipse that fronts the White House. In 1927 architect William Adams Delano proposes a grand scheme of nine buildings inspired by Paris's Louvre and Tuileries gardens. The vast frontages envisioned (the federal complex was almost twice as large as its inspiration) were to be broken up by monumental passageways and planted courtyards. Decades later James Freed would place his Pennsylvania Avenue rotunda where one such passage was planned. The hemicycle of what would eventually be named the Ariel Rios Building faced a proposed grand plaza that would stretch a block and a half to the 14th Street facade of what would become the Department of Commerce Building. The plan is approved, and work begins on the Commerce Building.

## 1930s

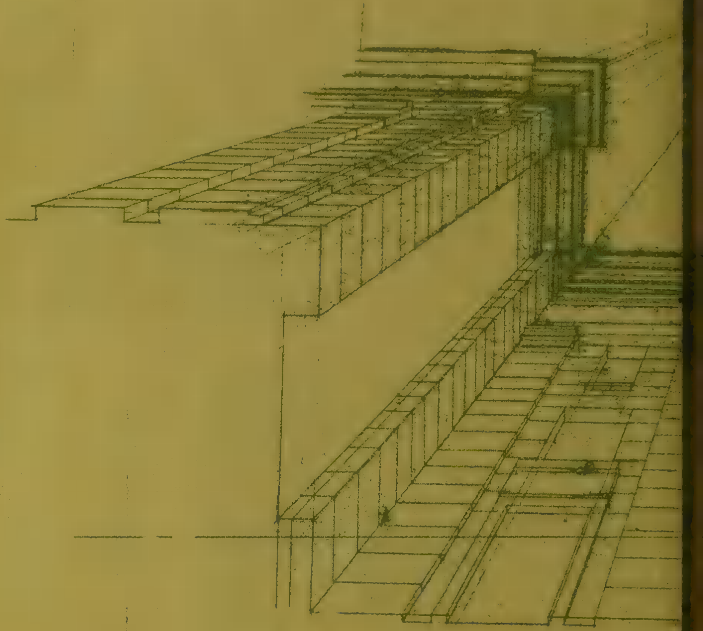
Most of the master plan is built out, including buildings for the Department of Justice, the National Archives, the Federal Trade Commission, the Internal Revenue Service, the Post Office, the Interstate Commerce Commission, and the Department of Labor. Except for the Oscar S. Straus Memorial Fountain (John Russell Pope, architect, and Adolph A. Weinman, sculptor), the Grand Plaza falls victim to lack of funds during the Great Depression. Its strategically located site becomes a vast parking lot.

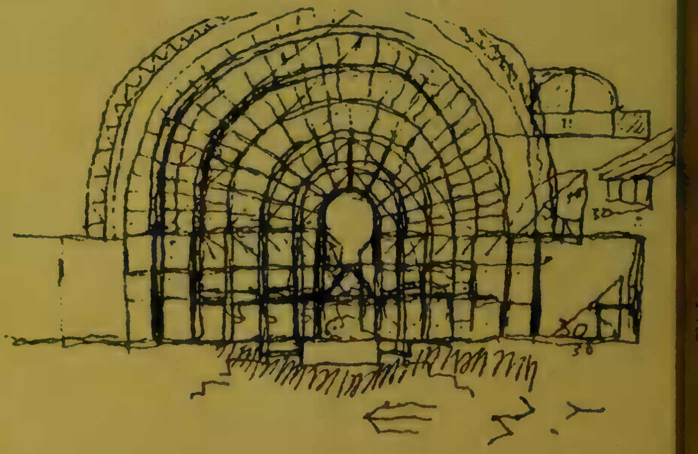
## 1986

Kenneth R. Sparks, a trade-center advocate, and Terence C. Golden, administrator of the General Services Administration (GSA), agree that a combined international trade center and federal office building would be an ideal use of the vacant parcel in the Federal Triangle.

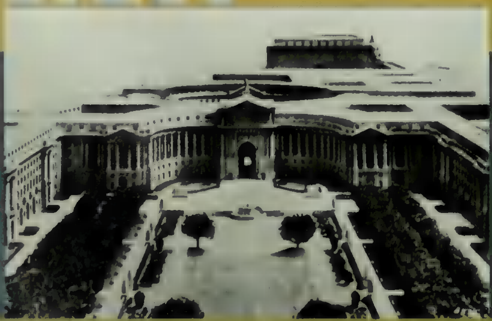
## 1987

Sen. Daniel Patrick Moynihan of New York, who regards the project as worthy of the Federal Triangle location, agrees to shepherd it through the Senate via the subcommittee on federal construction, of which he is a powerful member. President Ronald Reagan signs the



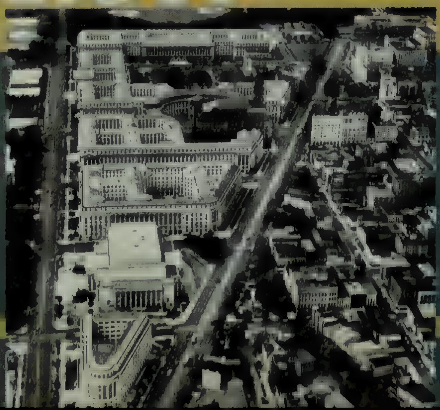


1920s

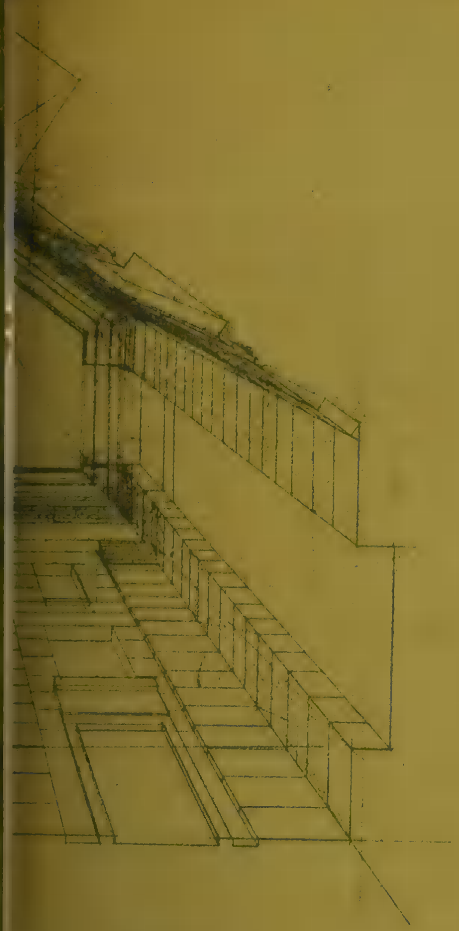


Model of the Grand Plaza that never got built.

1930s



Aerial view of the Federal Triangle.



eral Triangle Act. Though no get is mandated, GSA estimates the multimillion-square-foot ect will cost $362 million.

## 88

gress hopes that a consortium by a private developer will be to deliver a building more effi- itly and less expensively than is possible with the usual method of procuring both design and construction services through appropriations. The idea is to have the developer raise money privately for the project and then be paid back over a 30-year period.

The Pennsylvania Avenue Development Corporation (PADC), a quasi-governmental redevelopment agency, is put in charge, with GSA as its partner. A master plan is drawn up that includes what is called the International Cultural and Trade Center (ICTC), with 500,000 square feet of trade-related businesses, as well as exhibit space with a large-screen theater, a communications center that would use high-technology means to tie various countries together, four theaters for performing arts, and internationally oriented retail and dining. The project includes 1.1 million square feet to permit consolidation of several government agencies. GSA recommends placing Justice Department offices in the building because the department's headquarters are nearby. The commission charged with running the trade center balks, asking for trade-related agencies. The total proposed size is 2.7 million square feet, and the cost estimate at the time the request for proposals goes out to prospective design/build teams is $461 million.

## 1989

Seven development teams respond to the RFP. The lowest proposed cost is $556 milllion. The project is awarded to the Delta Group on the quality of the design and the strength of the team, even though it offers the highest bid at $747 million. The project has grown to 3.1 million square feet. The team changes its name to Federal Triangle Corporation and agrees to project trims to bring the budget to $738 million.

## 1990

Saratoga Development, the low bidder in the 1989 competition, sues, claiming the award was improperly made. Meanwhile, a development agreement is signed based on the $738 million estimate. Richard G. Austin takes over at GSA and demands cuts, while the trade center commissioners and others defend a well-finished, well-equipped building befitting the prominent location and prestigious mission. Austin proposes that the Federal Financing Bank lend funds to the project, which would considerably reduce financing costs. PADC requests a $738 million line of credit from the bank, which it receives. Austin wins $82 million in cuts, and the project cost drops to $656 million.

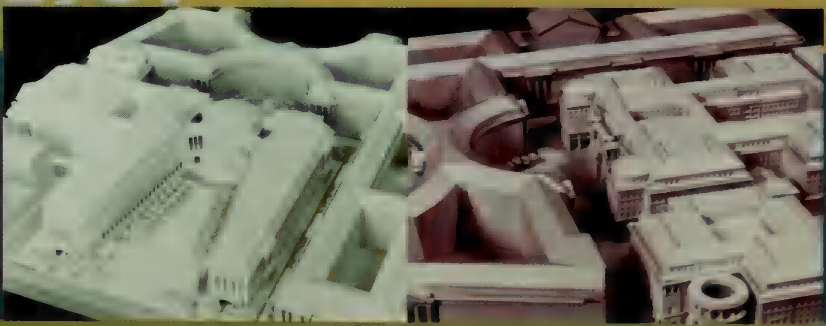
## 1991

A report by the Office of Management and Budget (OMB) says that the Environmental Protection

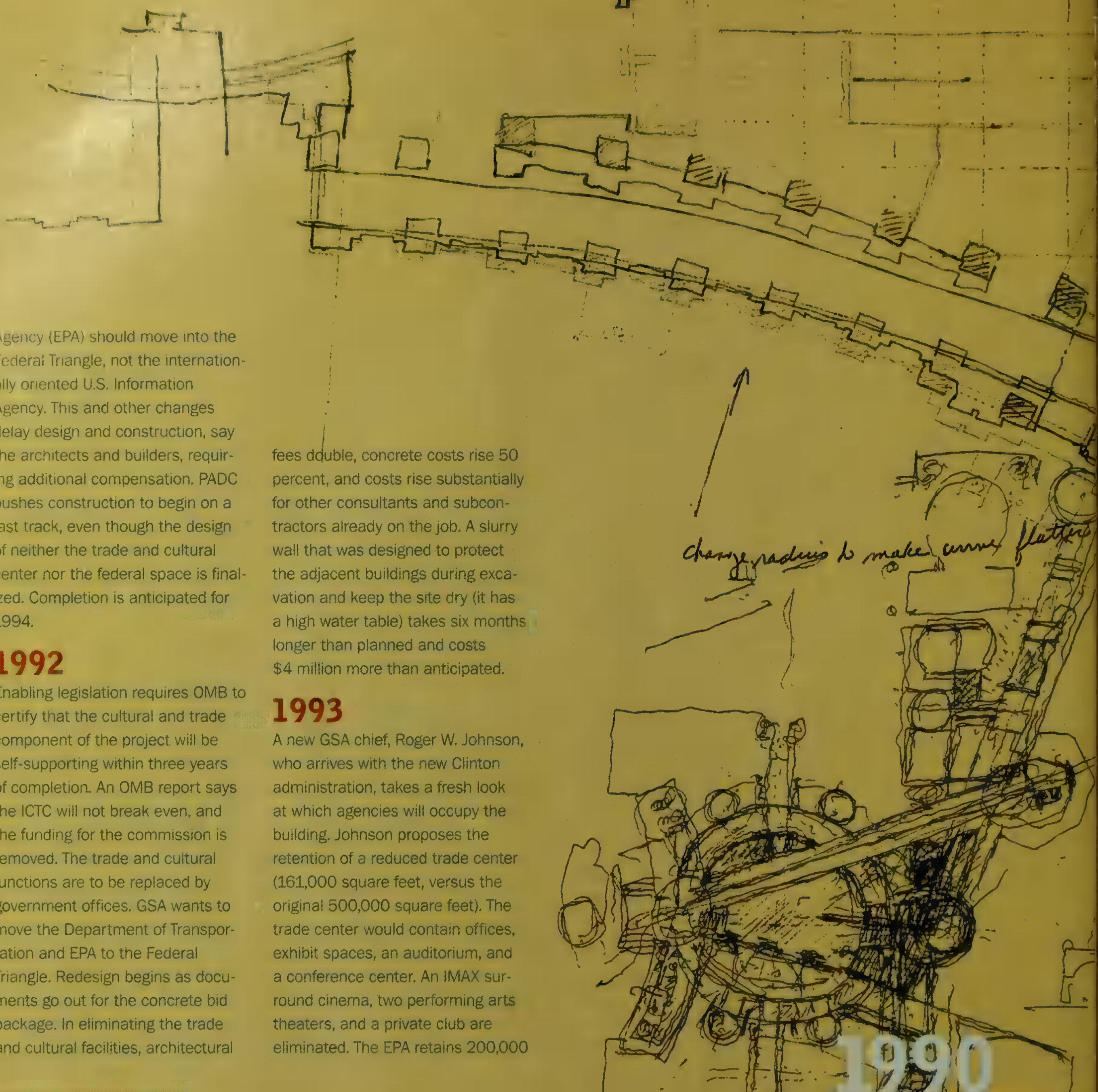
986

e of the Reagan Building when used as a parking lot.

1989



Two entries to the 1989 competition: SOM (left) and Michael Graves (right).



Agency (EPA) should move into the Federal Triangle, not the internationally oriented U.S. Information Agency. This and other changes delay design and construction, say the architects and builders, requiring additional compensation. PADC pushes construction to begin on a fast track, even though the design of neither the trade and cultural center nor the federal space is finalized. Completion is anticipated for 1994.

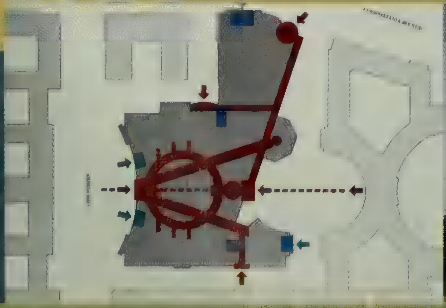
## 1992

Enabling legislation requires OMB to certify that the cultural and trade component of the project will be self-supporting within three years of completion. An OMB report says the ICTC will not break even, and the funding for the commission is removed. The trade and cultural functions are to be replaced by government offices. GSA wants to move the Department of Transportation and EPA to the Federal Triangle. Redesign begins as documents go out for the concrete bid package. In eliminating the trade and cultural facilities, architectural fees double, concrete costs rise 50 percent, and costs rise substantially for other consultants and subcontractors already on the job. A slurry wall that was designed to protect the adjacent buildings during excavation and keep the site dry (it has a high water table) takes six months longer than planned and costs $4 million more than anticipated.

## 1993

A new GSA chief, Roger W. Johnson, who arrives with the new Clinton administration, takes a fresh look at which agencies will occupy the building. Johnson proposes the retention of a reduced trade center (161,000 square feet, versus the original 500,000 square feet). The trade center would contain offices, exhibit spaces, an auditorium, and a conference center. An IMAX surround cinema, two performing arts theaters, and a private club are eliminated. The EPA retains 200,000

1989

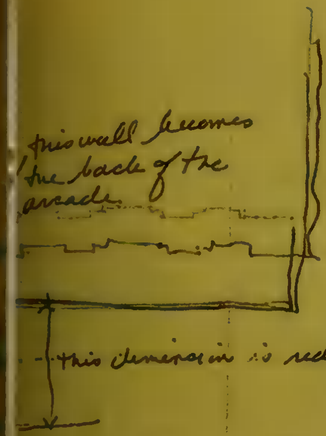


Freed's "architecture of movement" scheme.

Looking west to east through Freed's atrium.

1990

Model of structure connecting atrium to office blocks.



this wall becomes
the back of the
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this dimension is reduced.

pavilion has a back and a
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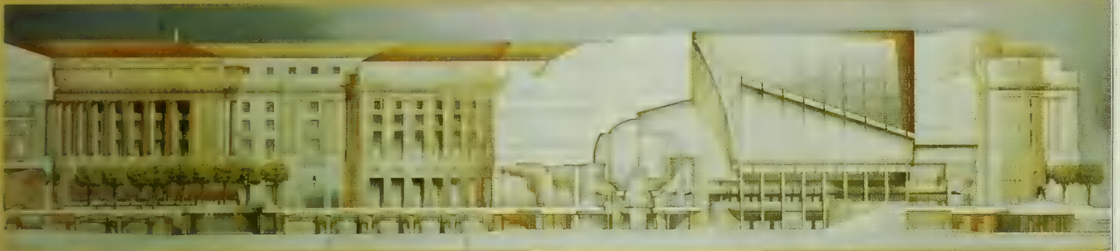


**Section through atrium of the Pei Cobb Freed design.**

square feet. The Agency for International Development and the Customs Services receive 956,000 square feet of office space. Congress mandates 80,000 square feet in which to relocate the Woodrow Wilson International Center for Scholars. Redesign continues as the concrete frame reaches grade.

## 1994

The allocation of space to federal agencies continues. The final form of trade-center functions is still under study. The concrete frame rises. The Saratoga suit is dismissed. Lester Hunkele III replaces M. J. Brodie at PADC and negotiates costs for delays so that contractors will move faster. Hunkele fears that the project will cost more than $700 million, according to an article in the *Washington Post.*

## 1995

Demands by the building's tenants spur additional redesign; a library requires reworking of floor reinforcement; EPA requests operable windows for its space. By December 1995 the concrete is completely framed up.

## 1996–97

In what some regard as an ironic gesture for an advocate of small government, the building is named for President Ronald Reagan, an honor he accepts. Congress shuts down PADC, leaving GSA in sole charge of the project. Construction pushes forward.

## 1998

The Reagan Building is dedicated on May 5 by President Bill Clinton. Some tenants are still moving in and the trade center anticipates full operation by mid-summer (81 percent of lease space is committed). Nancy Reagan does the ribbon-cutting duties for her husband. At mid-year, workers are changing the building again, substituting permanent finishes for the painted and drywall surfaces that had been temporarily "completed" for the dedication.

992

ing the site for construction.

1995

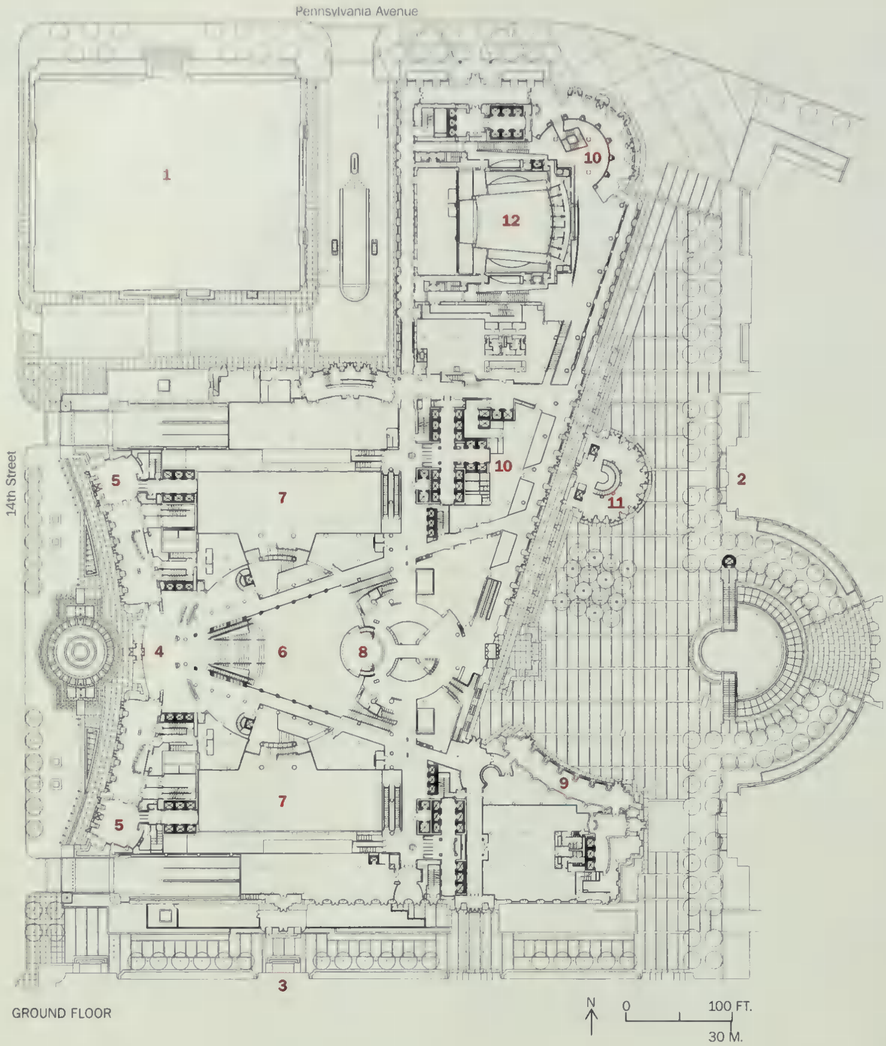
Pennsylvania Avenue rotunda being built.

1998

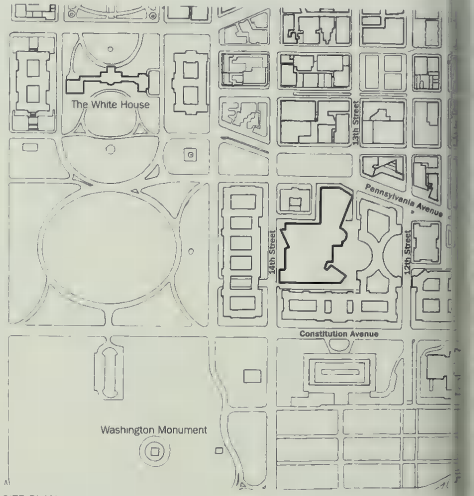
Looking west over the Rios Building to the new Reagan Buildin

1. *District Building*
2. *Ariel Rios Building*
3. *Customs Service*
4. *Main lobby*
5. *Agency lobby*
6. *Atrium*
7. *Trade center exhibits*
8. *Overlook (sculpture)*
9. *Wilson Center*
10. *Trade center*
11. *Restaurant/reception*
12. *Auditorium*

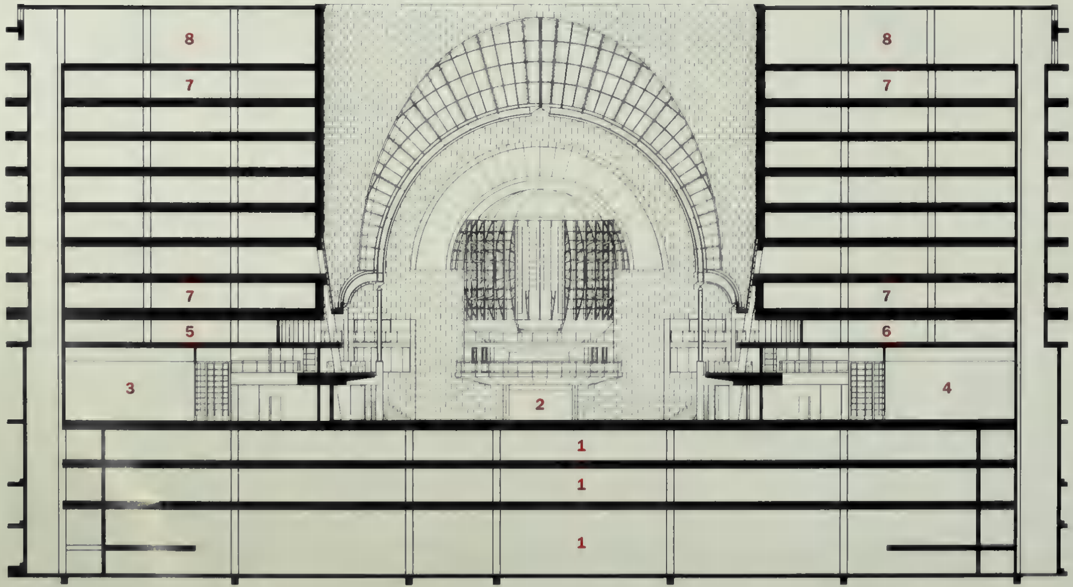
**A trade-related conference center occupies the northern part of the site (floor plan, left), while trade exhibits line the grand atrium. The building is connected at the concourse level to a nearby Metro station.**



GROUND FLOOR

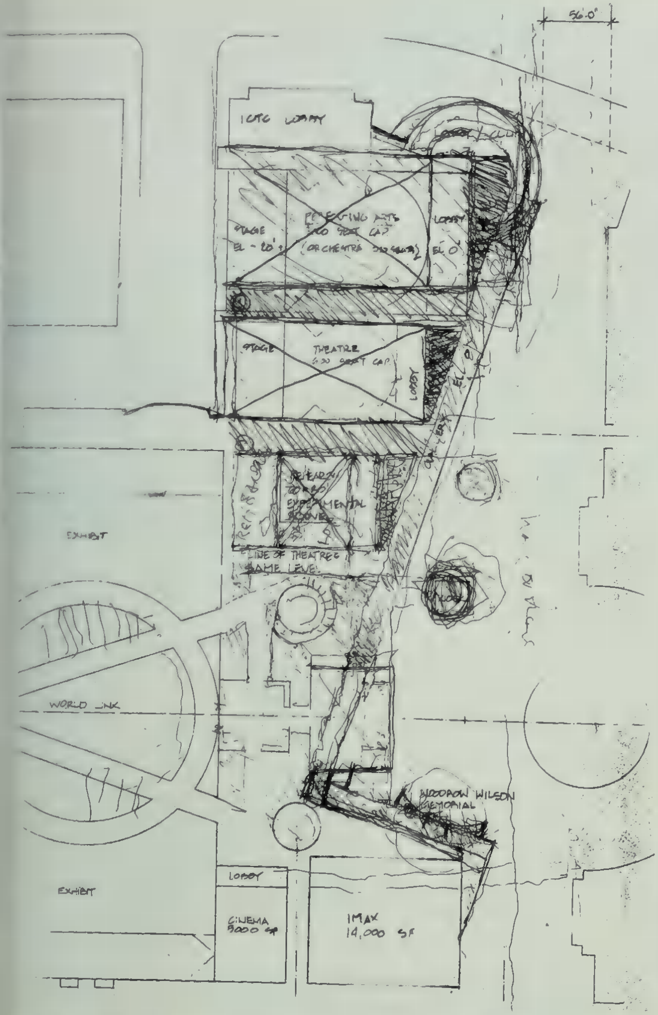


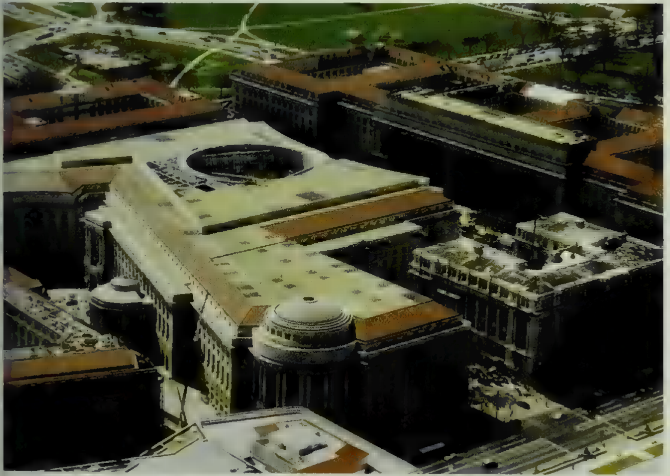
SITE PLAN



SECTION

1. *Parking*
2. *Hemicycle concourse*
3. *Museum exhibit*
4. *Trade exhibit*
5. *Conference center*
6. *Trade information*
7. *Office*
8. *Mechanical*





**The Reagan Building's context includes monumental Beaux Arts neighbors: to the left is the Ariel Rios Building (now being renovated), to the right is the District Building, and beyond that to the west is the massive Department of Commerce Building.**

So he looked deeper for a strategy and found one around an "architecture of movement," the idea of coherently and invitingly orchestrating the various circulation routes demanded by the complex program. He drew a path from 14th Street eastward through a convex facade, which he would make the main elevation. Inside the building, a barrel-vaulted, glass-roofed atrium would open wider as the visitor moved deeper into the building—an internal replacement for the Grand Plaza dreamed of but never realized on the site. It would be a place designed to stir together artists and exhibitors, tourists and bureaucrats.

Freed drew diagonals along two sides of the atrium (diagram, left), forming "streets" along the trade-center "storefronts." These movement systems led to another diagonal—a line drawn perpendicular to Pennsylvania Avenue. Freed made this, his most anti–Beaux Arts move, as a reconciliation of the orthogonal north-south arrangement of the older Triangle buildings and the northwest-to-southwest thrust of L'Enfant's great avenue. In the process of creating this east elevation, he opened a wide courtyard facing the hemicycle of the Rios Building. He also put an arcade on the elevation and placed behind it the performing arts spaces and their lobbies, culminating in a rotunda at the Pennsylvania Avenue corner. Scaled to adjacent buildings, the rotunda would form an inviting entrance to the cultural and trade venues from downtown.

**FREED DEVELOPED AN "ARCHITECTURE OF MOVEMENT" THAT ORCHESTRATES THE VARIOUS CIRCULATION ROUTES.**

Looking back on the competition entries, Freed characterizes his as the least Beaux Arts in character, the only "asymmetrical" scheme. Yet it won, even though Delta's price was highest. A consensus of observers says that it was Freed's design that tilted the decision to Delta. "The breakthrough was swinging that perpendicular to Pennsylvania Avenue and the great conical atrium," comments J. Carter Brown, who advised PADC and served on Washington's Fine Arts Commission.

### The scheme survives numerous assaults

Against all odds, Freed was able to win loyal allies in the struggle to realize the project. How did he do it? Certainly the near-reverent public appreciation of the Holocaust Memorial was important. But his undeviating commitment, whatever the slings and arrows of Congress or the Office of Management and Budget, earned him friends like Brown, Moynihan, GSA's Golden, and M. J. Brodie, who was PADC's executive director until 1993. Freed was, says Brown, "one of the most responsible architects we have ever had. He kept at it through many, many iterations."

As Freed refined the project, says Brown, "We were eager to see how his design would blend in with the Federal Triangle classicism and yet maintain a sense of clean Modernism." Freed calls his massing strategy "of our day," one that avoids the pitfalls of thin-stone appliqué and knee-jerk replication. Freed zeroed in on the site's anomalies, which, he says, "allowed me to use massing for different ends. It gave me the ability to fragment, which you would never see in Beaux Arts strategies." He put much of his effort into the internal courtyard facing the Rios Building. When Congress moved the Woodrow Wilson International Center for Scholars from the Smithsonian to the Federal Triangle, Freed gave it a separate identity by expressing it as a curved facade, the only element that visually extends the hemicycle of Rios. He pushed a rotundalike ballroom and reception space out of the east elevation, echoing the Pennsylvania Avenue rotunda and dividing the courtyard in a way that invites visitors.

Freed's allies like what they got: "I don't think there is any firm that does more painstaking and wonderful details than Pei Cobb Freed," says Brodie. Projects as whipsawed as this one often end up being caricatures of their best intentions. Freed's design, including carefully detailed atrium supports, glazing, sunshades, patterned terrazzo, limestone walls, and Belgian-block plazas, came through nearly unscathed.

The biggest blow to the design was the major program changes that occurred in 1992. Not only did removal of the cultural functions dramatically alter the nature of the building, but it occurred as the concrete frame went out to bid, so there was no chance to reconsider the basic design strategy. The auditorium was reconfigured, two recital halls and a surround-screen cinema were eliminated, and the 500,000-square-foot trade center became a 161,000-square-foot conference and exhibit venue.

Though some mixing of uses remains, the office component of the plan now dominates. There are very large floor plates with a low proportion of perimeter wall (indeed, the seventh floor, behind the cornice, has skylights but no windows). Further, urban design guidelines prevented Freed from glazing more than 30 percent of the exterior walls. The office floors suffer from relatively low ceilings, resulting from a 125-foot building-height limit. Freed defends such deep, low floors, but even if he had wanted to offer office workers more access to daylight and a less warrenlike plan, it would have been very difficult to do so on the site, given the sheer amount of square footage that needed to be accommodated.

**EVERYONE WANTED TO SEE HOW FREED WOULD BLEND FEDERAL TRIANGLE CLASSICISM WITH MODERNISM.**

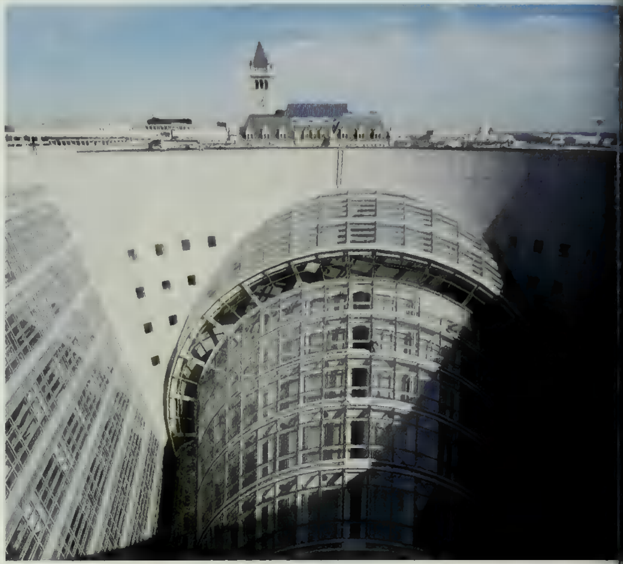
**Problems with the process: what went wrong**

In terms of its process, the Reagan Building took too long and cost too much. What went wrong? The combination of PADC, ICTC, and GSA worked at cross purposes, says Terry Soderberg, who was managing director of the Federal Triangle Corporation, and decision-making "had too many levels." The developers on the design/build team were supposed to expedite the building process but failed to. Soderberg says the developers were "at risk" only for the delivery of the project, not its operation. The project "would not have worked in the private sector," he says.

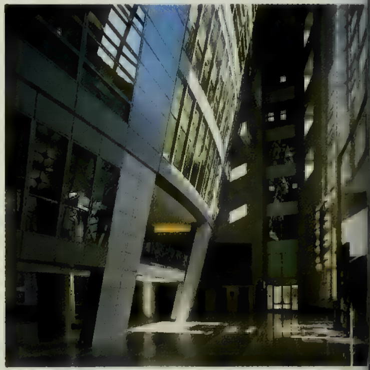
The developers, GSA, and PADC each had construction managers who were to ensure that the Federal Triangle Corporation expedited the project. They too seemed powerless to move the project forward more quickly. Soderberg, Brodie, and William Zeckendorf Jr. (a development partner) all said that the 11-acre size of the site and the 367,000-square-foot floor plates presented numerous time-consuming challenges. Though none of these challenges seems so unprecedented as to explain a seven-year construction period, the scale of client-generated changes makes the fixing of fault difficult. In the end, delays pushed the fees paid to project managers up to $149 million, according to the *Washington Post.*

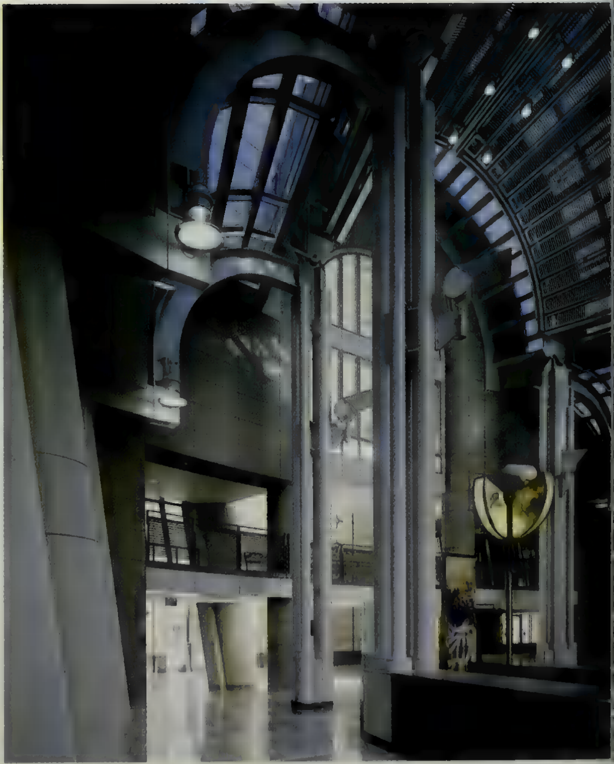
The privatization ideology underlying the project simply failed to deliver vaunted efficiencies. PADC proved less experienced in real-world construction than GSA, says Soderberg. But drafters of the Federal Triangle legislation did not trust GSA and put PADC in charge. In addition, ICTC and PADC wanted the best facility possible, which put them at loggerheads with GSA, whose clients would have to pay higher rents.

The client's assumption that the cultural and trade components needed to be self-supporting is also questionable. There was, first of all, no precedent for such a combination, so before-the-fact estimates of performance were little more than speculation. The Federal Triangle Corporation's accountants said it would work. GSA and OMB claimed it

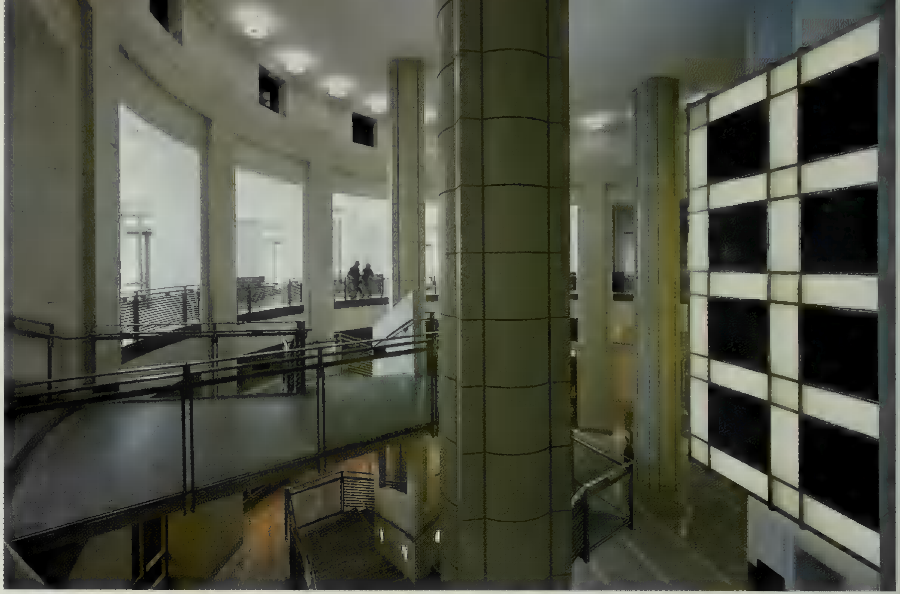


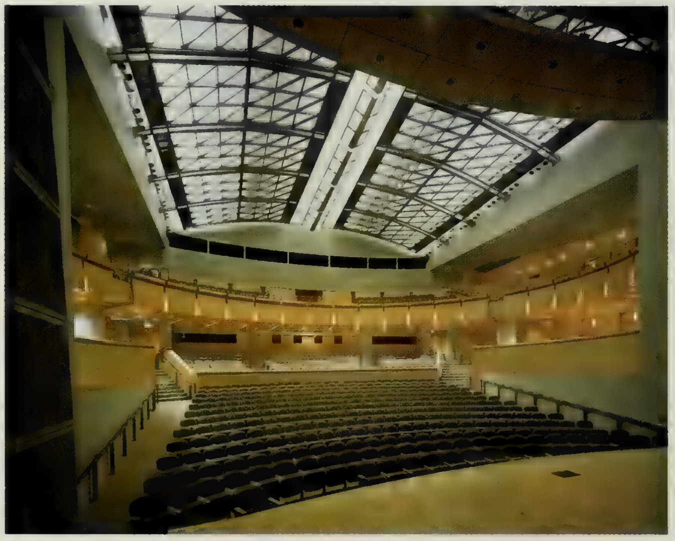
**Seen from above, the atrium is a sloping glass funnel (above). Spaces leading to and around the atrium (right and below) offer dynamic views through the building. Metal tubes screen sunlight in the atrium, which broadens out as it extends beyond the stair (opposite).**

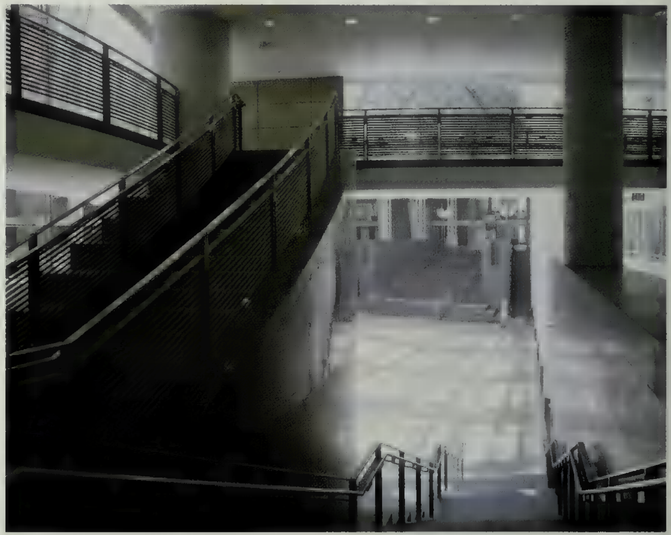




A stairs in the Pennsylvania Avenue rotunda (right) links a street-level arcade to the trade center's conference area. The auditorium (below) has a backlit ceiling. A curving stair (below right) takes visitors from the atrium to a mezzanine-level meeting area that is animated by a neon sculpture by Keith Sonnier (opposite).







wouldn't, and they prevailed—but at great cost to the project. Directives from OMB and Congress clashed either with the desires of GSA or of the trade center, which snarled agency tenant plans for years. Costs grew to the point that agencies balked at the rents that would have to be paid to amortize the project's cost. The final tally is $738 million. The low interest rate means that the cost with capitalized interest is $818 million.

Time will tell how well Freed has adapted the design to its context, whether he has found a proper civic scale or merely a bombastic one. The bombastic label may be hard to avoid, given the imperial scale of the neighboring buildings. However correct contextually, the Reagan Building does not present a low-lying aesthetic consistent with the less-hubristic role Americans want government to play nowadays. Architecturally, the building still aspires to mix Washington's business, cultural, bureaucratic, and tourist sectors, but the shrunken trade program may not be enough to draw many visitors beyond those doing business in the complex.

Freed hopes the costs and delays won't be the criteria by which the project is evaluated. Says Freed, "The Federal Triangle shouldn't be judged by itself, but by what it does for the whole city." ■

**Sources**

**Exterior stone cladding:** *Indiana Limestone Co., Deer Isle Granite*

**Precast concrete:** *Exposaic Industries Inc. of Virginia*

**Curtain wall:** *Midwest Curtainwalls*

**Fluid-applied roofing:** *Baker*

**Terra-cotta tiles:** *Gladding McBean*

**Skylights:** *United Skys, Inc., SuperSky Products*

**Bronze entry doors:** *Ellison Bronze*

**Revolving doors:** *Crane Fulview Door Company*

**Interior metal doors:** *Acme*

**Interior wood doors:** *Weyerhaeuser, Eggers*

**Acoustical ceiling and suspension grid:** *Armstrong*

**Paints and stains:** *Sherwin-Williams, Duron*

**Wall coverings:** *Koroseal*

**Floor and wall tile:** *Dal-tile*

**Carpet:** *Shaw Industries*

**Raised flooring:** *Tate*

**Fixed seating:** *Irwin Seating Co.*

**Interior ambient lighting:** *Cornelius (custom)*

**Downlights:** *Edison Price*

**Office lighting:** *Day Brite*

**Exterior lighting:** *Cornelius/Sterner*

**Lighting controls:** *Square D*

**Elevators:** *Schindler Elevator Corp.*

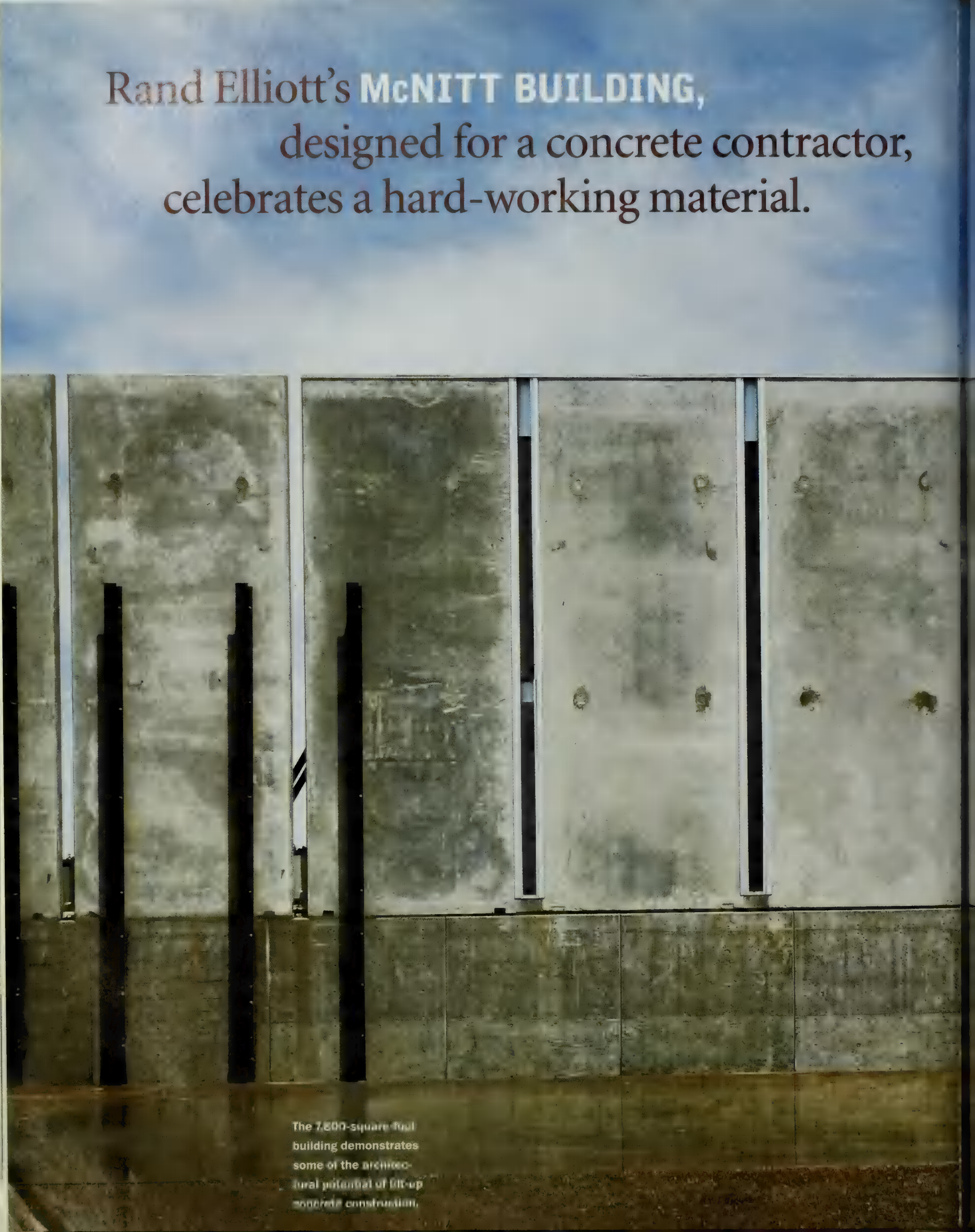
**Elevator cabs:** *Tyler Elevator Products*

**Wheelchair lift:** *Concord*

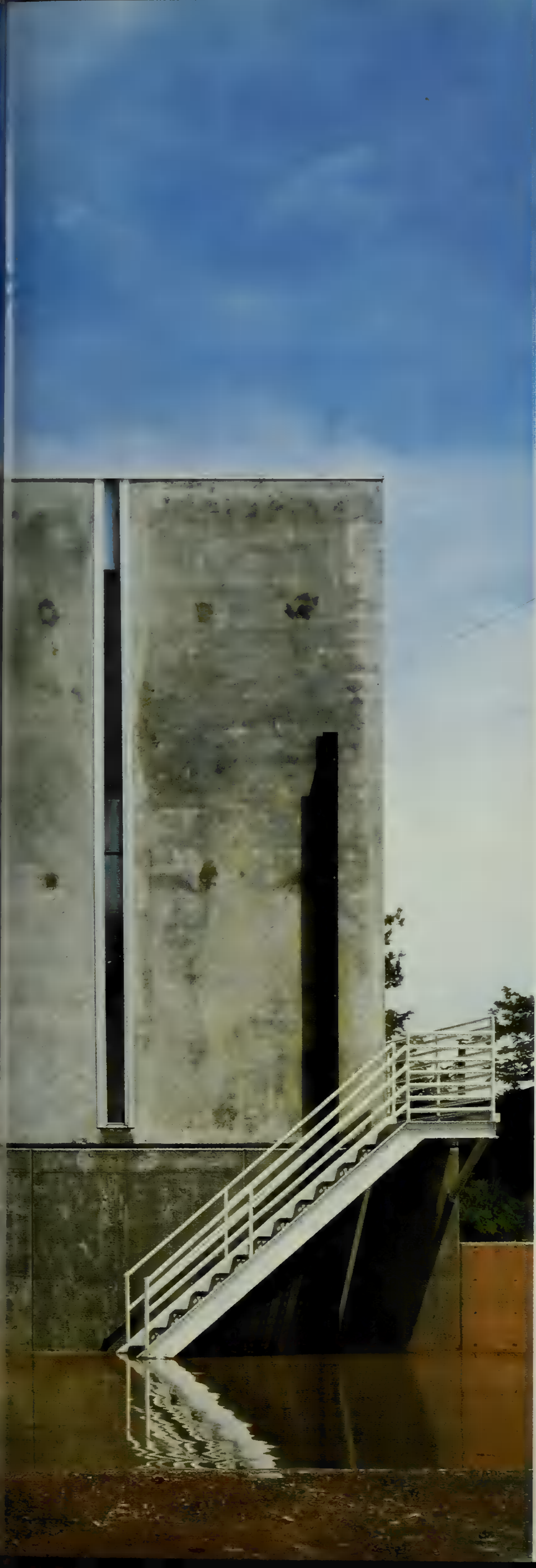
**Plumbing fixtures:** *American Standard*

**Water fountains:** *Hawes*

# Rand Elliott's **McNITT BUILDING**, designed for a concrete contractor, celebrates a hard-working material.



The 7,800-square-foot building demonstrates some of the architectural potential of tilt-up concrete construction.



PHOTOGRAPHY: © BOB SHIMER/HEDRICH BLESSING

**by David Dillon**

A client with no money wants a new building on a site that is too small—and he wants it yesterday. Architects get these irrational requests all the time and either ignore them or produce a down-and-dirty scheme that can be knocked out by an assistant in the back shop. The results litter every American roadside.

Oklahoma City architect Rand Elliott received such a request from Kelly McNitt, a local contractor who specializes in tilt-up concrete for warehouses and shopping centers. With his business booming and his existing quarters exploding, McNitt needed more space in a hurry. Nothing fancy or cutting-edge, he explained, just a straightforward, economical building that he could move into in a few months.

Going beyond the letter of the commission, Elliott chose to celebrate the simplicity, economy, and surprising expressiveness of precast-concrete construction. "My goal was to make the building a marketing tool for a young company," he explains. "I wanted to be very honest about what concrete is, yet I also wanted to show its architectural possibilities."

The new building had to fit on a 100-by-135-foot patch of unassuming industrial land hemmed in by a boatyard, a row of shacks, and McKnitt's existing offices, a two-story precast pile that resembles the "before" half of a renovation ad. This clearly was not the place to be slick and trendy, so Elliott went raw and basic, making the entire structure an illustration of tilt-up technology.

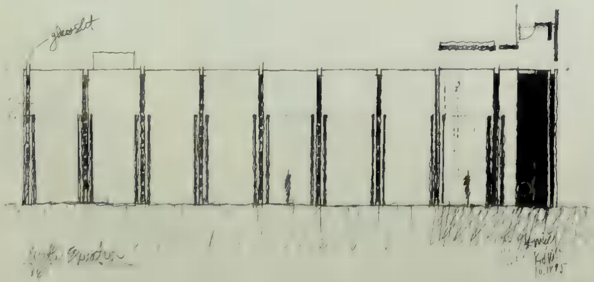
The exterior walls are precast-concrete panels, 24 feet high and roughly 10 feet wide, that have been finished in a variety of styles and textures: board-formed, sandblasted, smoothed, stained. Elliott hoped to use one panel size throughout but ended up with three. The panels are separated by eight-inch-wide glass strips, which dramatize their lightness and thinness, and are braced on three sides of the building by recycled oil-field pipes. The steel pipes resemble tepee poles—an appropriate analogy in Oklahoma—and reinforce the idea of the building as a construction site.

On the east wall the oil pipes are folded into the facade to frame a fire door, while in the parking lot they are pulled out to form the corners of an implied outdoor room, complete with concrete floor and buffalo grass border. The long west wall is braced from behind, which makes it appear self-supporting.

Elliott resisted all temptation to design a conventional corporate interior or to make the materials seem other than what they are. A blue-collar aesthetic prevails throughout. Roof decking, bar joists, and air ducts are exposed; the floors are scored concrete; the gypsum-board walls follow the rhythms of the exterior panels, with slotted windows providing dramatic shafts of light. Because of site constraints, the *(text continues)*

*Contributing editor David Dillon is the architecture critic for the* Dallas Morning News *and the author of the new plan for Washington, D.C.,* Extending the Legacy, *and forthcoming books on the FDR Memorial and Texas architect O'Neil Ford.*

**Project:** *McNitt Building, Oklahoma City, Oklahoma*
**Owner:** *K. J. McNitt Construction, Inc.*
**Architect:** *Elliott + Associates Architects—Rand Elliott, FAIA, principal-in-charge*
**Engineer:** *Pendergraf Engineering*
**Consultants:** *United Acoustics (acoustics); Shawver & Son (electrical); United Mechanical, Inc. (HVAC); Garland's (landscaping); Penny Lighting Sales (lighting)*
**General Contractor:** *K. J. McNitt Construction, Inc.*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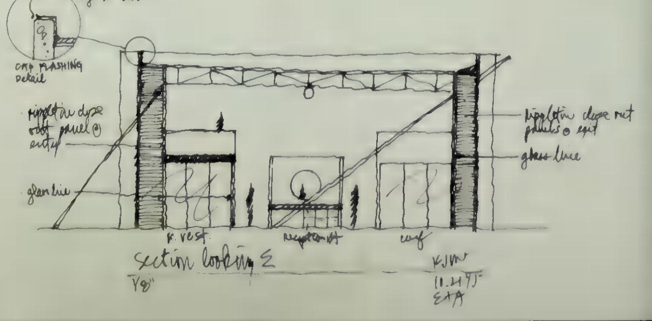
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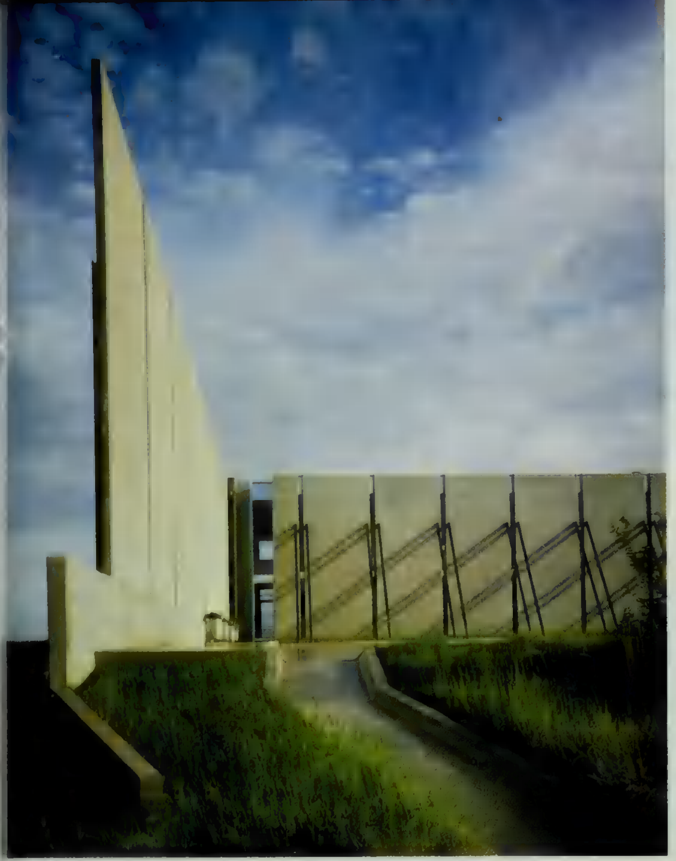
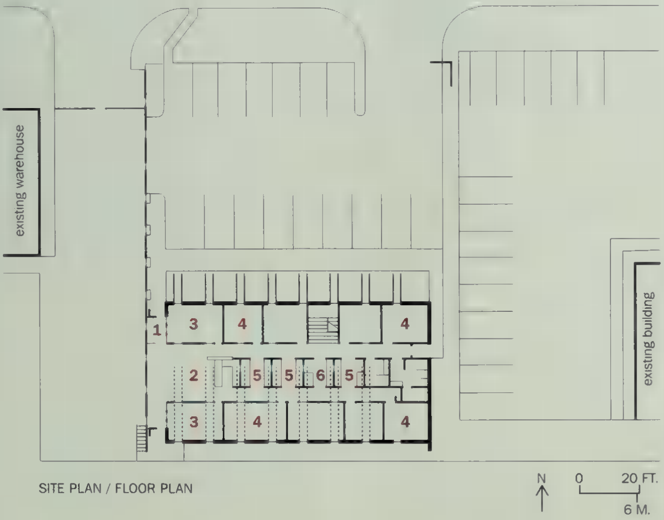


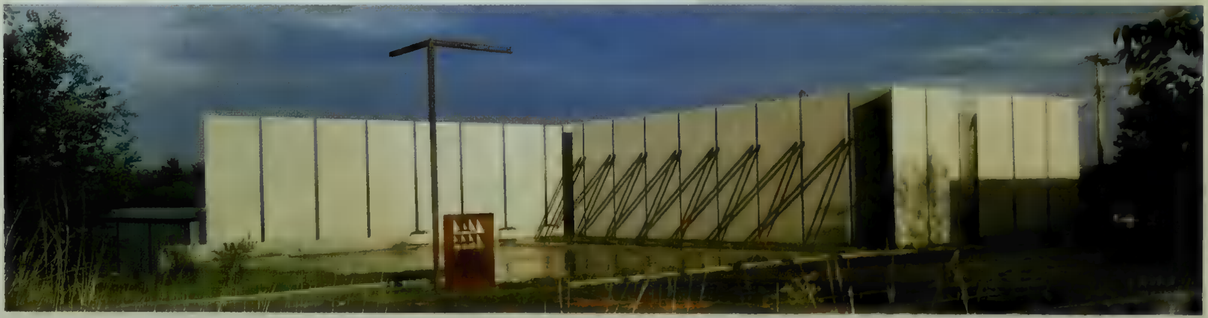
**Tilt-up concrete panels are separated by eight-inch-wide strips of glass and braced by recycled oil-field pipes (opposite). The west wall, extending beyond the building envelope, is braced from behind so it seems self-supporting (left).**

1. *Main entry*
2. *Reception*
3. *Conference*
4. *Office*
5. *Support*
6. *Photocopying*



SITE PLAN / FLOOR PLAN

**A border of buffalo grass around the parking lot initiates a dialogue between the natural and the industrial (right). The precast panels, 24 feet high and about 10 feet wide, exhibit a variety of finishes and textures.**



## PROFILE

**Rand Elliott grew up in** Clinton, Oklahoma, in the western wheat belt, and has spent most of his 48 years learning to see it. "I'm looking for a spirit or emotion that comes from this place," he says, "one that I can bring to my architecture and that won't run dry."

Elliott's early work was so crisp and rational that he envisioned a career as a prairie Mies van der Rohe. But while that work brought him critical acclaim, it left him feeling disconnected and adrift. He considered moving east, then decided to stay put and reinterpret Modernism for Oklahoma.

In 1988 he designed a gateway for the Oklahoma City airport: four monumental steel arrows, 70 feet high. This was followed by the ESEO Federal Credit Union, a low-slung building with a broad roof supported by rusting steel columns that branch like trees. With the McNitt Building, Elliott fuses regional and industrial influences: spare precast, steel oil pipes that resemble tepee poles, native buffalo grass.

"It takes time to synthesize those materials so they don't seem hokey," he says. It also takes talent to get beneath the familiar surfaces of a place to layers of meaning that lie deep, like bedrock. *D.D.*

**A blue-collar aesthetic prevails in the interiors, with roof decking, bar joists, and air ducts all exposed. Site constraints forced the angled bracing pipes indoors on the south wall (left and opposite), turning them into dramatic elements that define offices, conference rooms, and even the reception desk in the open office area.**

pipe bracing for the south wall is inside the building, defining offices and conference rooms, even providing the base for the reception desk. Elliott also took advantage of the soaring volumes created by the precast panels to insert a loft, which seems to float above the main floor.

### A building that sells itself

Kelly McNitt says that his new building has generated at least three major jobs and given the company credibility it didn't have before. "I use it as a sales tool every chance I get," says McNitt. "If customers don't ask for a tour when they come in, I give them one before they leave. They're surprised at the scale and the complexity of the work we can do."

The building went up in five months and cost only $400,000. One reason for these economies is that client and architect had known one another for years. McNitt did drafting for Elliott as a student, and after he started his own company they collaborated on several projects, including a series of modular ATM buildings for banks. Knowing what to expect—and what to avoid—allowed them to bypass the usual roadblocks and get on with the job. Elliott supplied the design, while McNitt produced the working drawings and supervised the construction.

"If I'd designed it myself it would have been a shoebox," McNitt concedes. "A very functional shoebox, perhaps, but not very sophisticated. I knew that Rand would challenge me but that I'd probably end up with a unique product." The two worked out the details in Saturday morning skull sessions in McNitt's office. Elliott would do a freehand sketch, McNitt would have it priced and built. No protracted consultations. Elliott admits that initially the process terrified him. "I'm not accustomed to working that way," he explains. "I like to put something down, refine it, get a hard drawing, then refine it some more. I was afraid that the process would damage the integrity of the building. It took a while to get comfortable with it."

The only major disagreement occurred over the design of the west wall. Elliott wanted to perforate it randomly with three-inch holes, then fill them with wine bottles, flower vases, and other kinds of glass to show concrete's versatility. McNitt saw the perforations as a maintenance nightmare that would also detract from the purity of the design. He prevailed. "Rand and I know one another well enough not to be overbearing about such things," he says. Elliott vows to try the perforated wall on a future project.

A common assumption about constraints is that they produce mediocre architecture. But the McNitt Building proves just the opposite: that constraints can give architecture greater power by forcing architects to think more strategically. The building is all about adapting to limitations. Its forms and details are a direct response to the demands of the concrete-construction process, not to an abstract notion of style. There are no gratuitous gestures. The appearance is the process—not the same thing as form following function, but close. ■

**Sources**

**Aluminum windows:** *Kawneer, Associated Glass*

**Solar safety glass:** *Associated Glass*

**Paints:** *Sherwin-Williams*

**Plastic laminate:** *Formica, American Standard*

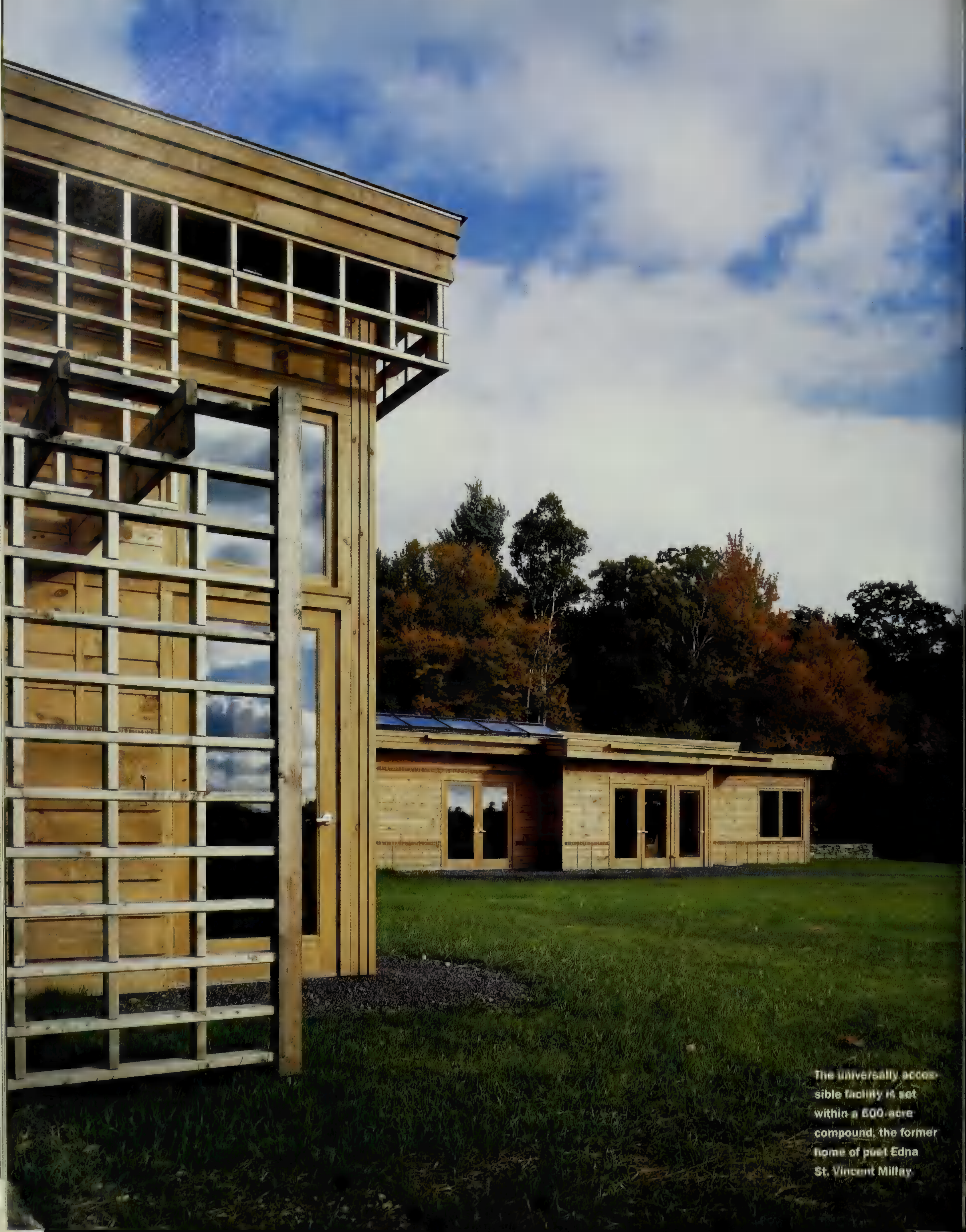
**Cotton wall fabric:** *IDS*

**Resilient flooring:** *VCT (Kentile Desert Sands)*

**Pendant fluorescent uplights:** *Metalux*

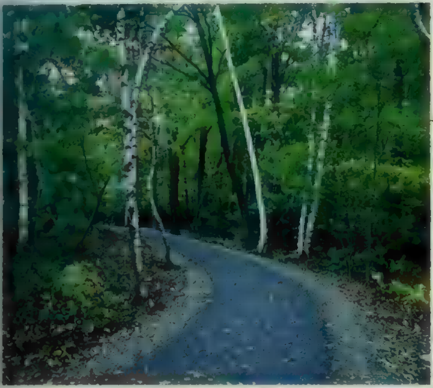
**HID uplights:** *Indalux*

**Parking lot light:** *Lampas*



The universally accessible facility is set within a 600-acre compound, the former home of poet Edna St. Vincent Millay.

# A new building at the MILLAY COLONY allows visiting artists to live and work in a universally accessible environment.



Special multitextured pathways allow visually impaired visiting artists to enjoy the grounds of the Millay Colony, located in Austerlitz, New York.

**By Peter Slatin**

For artists with disabilities who have learned to tailor their workspaces and homes to compensate for loss of mobility, sight, or hearing, finding a studio and residence away from home has been a virtual impossibility. Matter-of-fact daily tasks, transposed to an unfamiliar environment filled with obstacles, turn each workday into a frustrating battle. If those obstacles extend into the workspace, physical frustrations are compounded by mental fatigue and exhaustion; inevitably, work suffers.

In the early 1990s, directors of the Millay Colony for the Arts, a tiny 25-year-old colony in Austerlitz, New York, southeast of Albany, had found themselves forced to turn away some qualified artists with disabilities. The ancient converted barn and garage spaces that formed the studios and living facilities at the colony, located on the pastoral grounds of Steepletop, the historic home of poet Edna St. Vincent Millay, simply could not be accessed by an individual in a wheelchair. Faced with a need to renovate and expand, the colony's directors chose to make their new main building a prototype, blending universal access and the arts.

In late 1994, Ann-Ellen Lesser, Millay's executive director, began asking disabled artists and writers—myself among them—for help on this unusual but simple building project. The idea, she explained, was to assemble an advisory committee to work closely with the designer in charge of the project, Vermont-based artist Michael Singer, and the architect of record, Joseph Cincotta. The need for a committee "was almost a given," explains Lesser.

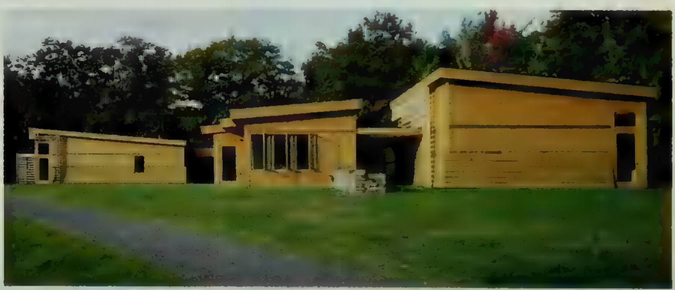
From the project's outset, Lesser says, the Millay board saw its program not just as the basis for a new building but as a platform for exploring the full range of accessibility issues in building design. Lesser's objective was to build a universally accessible studio-residence facility. "Our program from the beginning was fourfold," explains Lesser. "We wanted a universal design for the building, new product development, committee input, and sharing of lessons learned." In addition to myself, the advisory committee included writer Kenny Fries, filmmaker Sharon Greytac, writer Raymond Luczak, sculptor Scott Nelson, and visual artist Charles Strouchler.

The building's minuscule budget was set below $500,000, reflecting Millay's scant resources and an environment of severely contracted federal arts funding. Moreover, getting potential private donors to focus was no easier than getting the attention of government arts agencies. "It was hard to get large foundations or corporations to realize that a small organization in a little town in upstate New York was doing something that would have so much effect," says Lesser.

First, the building had to be situated within the 600-acre Steepletop compound, which Millay had purchased in 1925. The site chosen for the building was at the top of a steep rise, but landscaping was added to shield it from view along the public road below. "The layout responded to the site and to the issue of privacy," Singer explains. "You can't see the roofline from the road, and we wanted to make the residences and studios as private visually, emotionally, and acoustically as possible, not only from the outside world but also from

*(text continues)*

*Peter Slatin is a New York City–based freelance writer. He is a frequent contributor to* Barron's, The New York Post, *and* Urban Land.



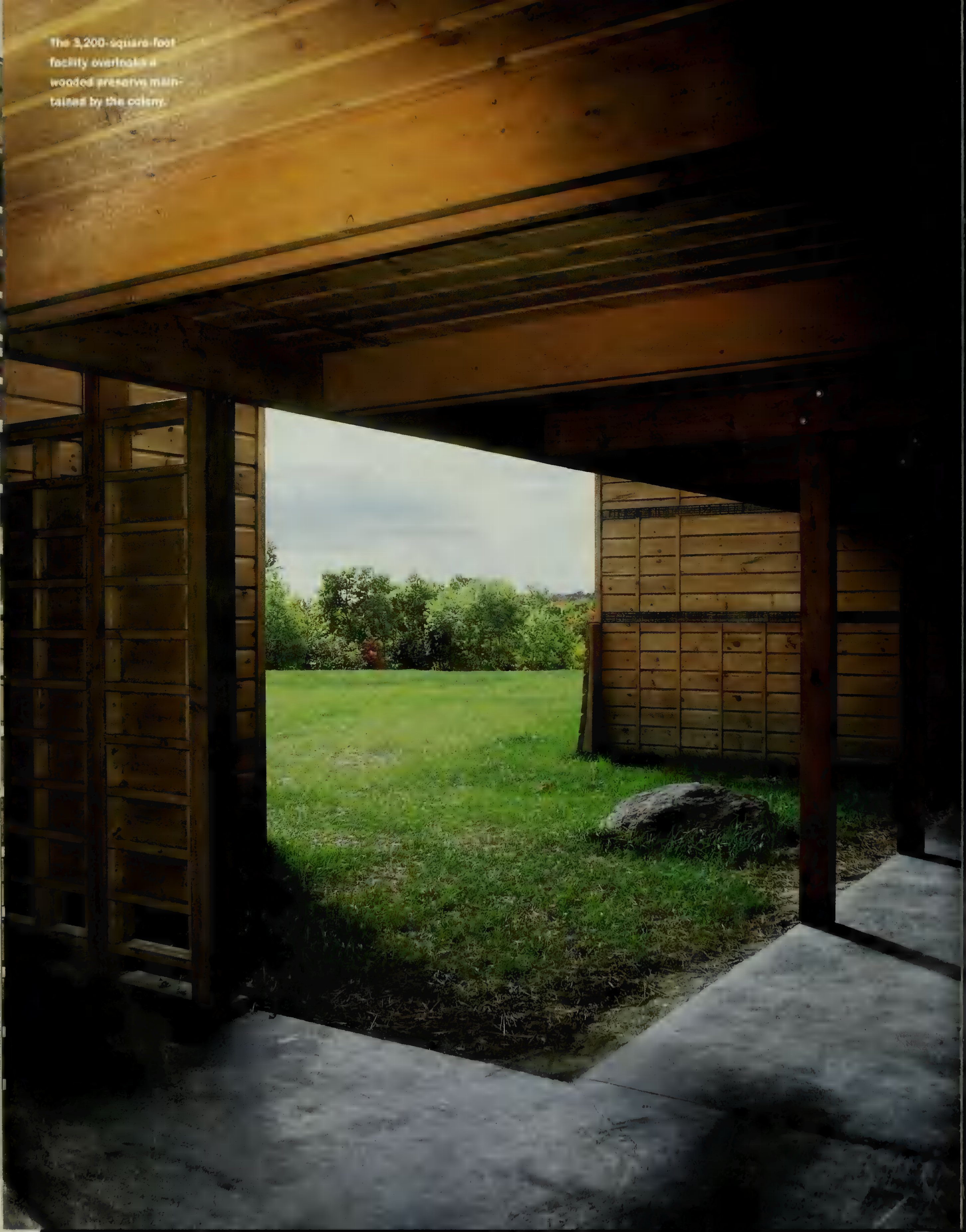
**Project:** *Main Building at Steepletop, Millay Colony for the Arts, Austerlitz, New York*

**Designer:** *Michael Singer, artist; Sterling McMurrin, Karol Kawaky, design team*

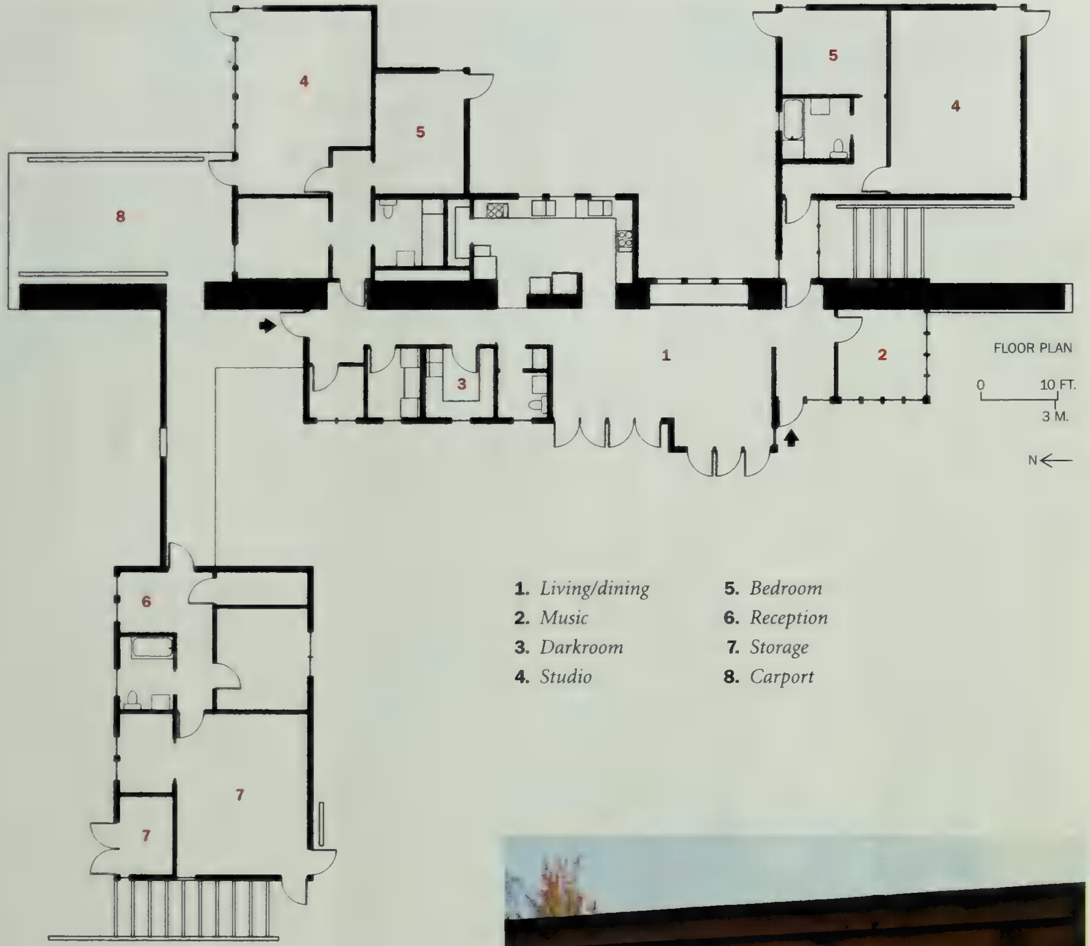
**Architect of Record:** *LineSync Architecture and Planning—Joseph Cincotta, principal-in-charge*

**General Contractor:** *Caldwell Builders—Rob Caldwell, Bill Casey*

**Darkroom design:** *PLF Imaging*

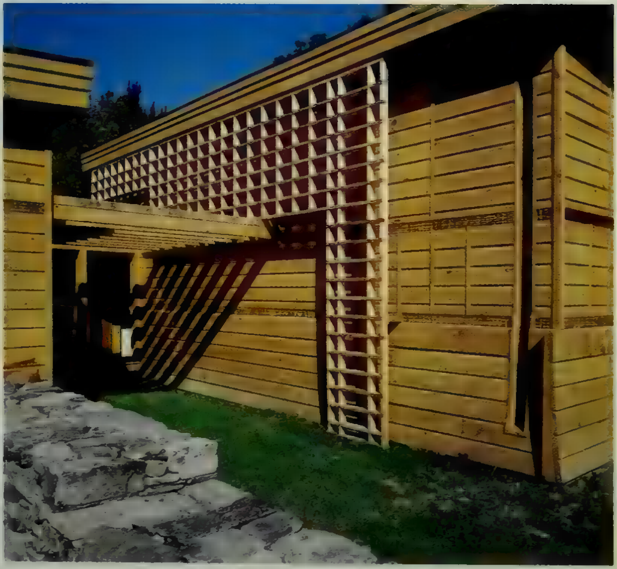


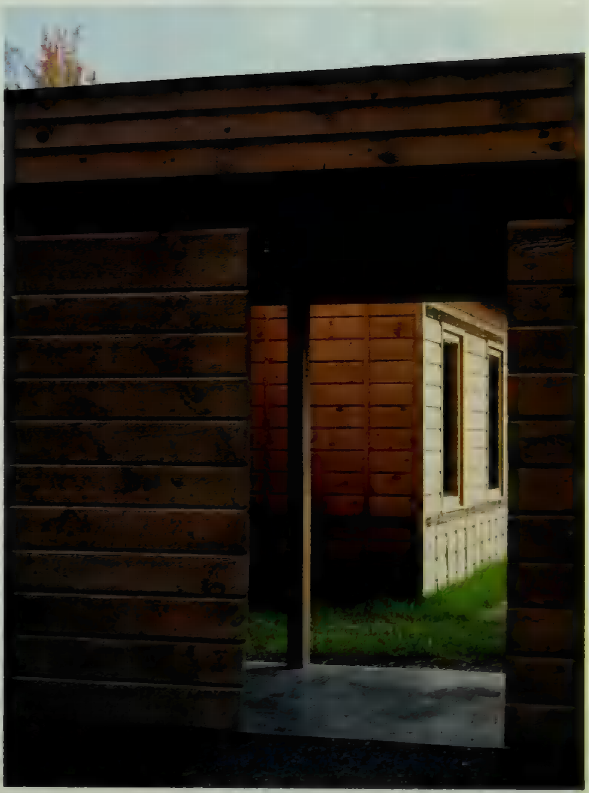
The 3,200-square-foot facility overlooks a wooded preserve maintained by the colony.



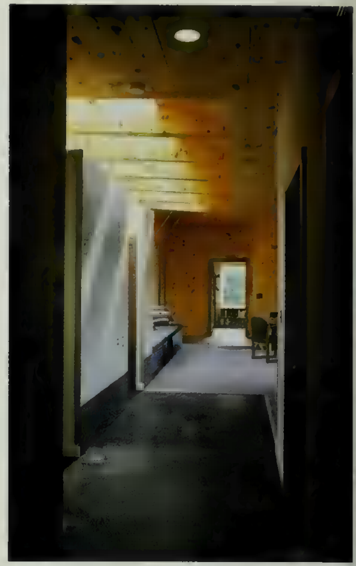
1. *Living/dining*
2. *Music*
3. *Darkroom*
4. *Studio*
5. *Bedroom*
6. *Reception*
7. *Storage*
8. *Carport*

**A sheltered carport and walkway ease passage for artists in wheelchairs (right). Pine cladding with quarry marks was chosen by Singer for its decorative effect.**





Designers worked with manufacturers to produce universally accessible products. Other innovations include strong color contrasts between wall covering and flooring (right) to help the visually impaired. A niche under a bench is for guide dogs (opposite).



each other." That concern, he says, drove the building's layout from a central spine.

Before the advisory committee met, Singer and the design team laid out a basic floor plan for the building's three studio-residences and the common areas. These include a kitchen, lounge, and dining room, as well as a music room. In addition, there is a darkroom, a laundry room, and office space with a reception area for Lesser, set apart from the main facility but connected by a covered walkway. If all goes according to the long-term plan, this office will be converted to studio-residence use as the colony expands.

Construction was slab-on-grade, so that all door sills could be flush with the ground. Although the colony asks artists to come without their spouses or companions, two of the bedrooms were designed to accommodate a personal assistant for wheelchair users. "One of the things that make this project different is that you've got a new set of up to five people coming every month," says Singer. "That's a different dynamic than a family of five, and the notion of flexibility is very important."

In the fall of 1995, the committee assembled at the Lighthouse, a Manhattan facility for the blind and visually impaired that itself had been rebuilt for universal accessibility by Mitchell Giurgola in 1992. On the conference room table was a tactile map of the floor plan. Our task was to dissect the plan, describing what each of us would like to see implemented in the built project.

During the course of the meeting, as the floor plan and a model of the 3,200-square-foot project were examined, the group described both specific and general considerations for the design of the interior spaces. These included the obvious questions of the height of kitchen and bathroom appliances as well as the width of walkways and turnarounds, but they also touched on some lesser-known issues. For example, a bench flanking one wall of the common living room–lounge area has a cutout space into which guide dogs can nestle while their masters sit talking on the bench—a feature that resulted from this exchange. "An observer might think it's a design move to break up the mass," comments Singer. "But you need to have a place where the dog can sit and be out of the way."

Another instance of creative planning that Singer points to is writer Kenny Fries's request for adjustable shelving in the bedroom furniture. Fries and others also wanted drawers that rolled easily and door pulls that were graspable by someone with incomplete hands or arms.

"The questions kept coming back to the experience of how someone who had a mobility problem would be able to access the building," Singer explains, citing the sheltered carport that affords direct access to the building for handicapped-driver vehicles. The committee, he adds, "made the program even more clear and specific because we had to look at every design element from the user's perspective, raising the question, 'Does it work?'"

A host of other issues emerged from the discussions of the advisory committee. Almost all are a neat fit with the "universal" label, because they incorporate basic design solutions for daily tasks. For the visually impaired user such as myself, strong color contrasts between wall and floor, at door and window openings, and even at light switches and outlets provide clues for guidance. Consistency of placement and clean, clear circulation pathways, not only from room to room but within each room, provide real benefits to the totally blind. Translucent shades over skylights and windows act to mute the harsh effects of direct sunlight, which can be disorienting; nonglare surfaces on walls and flooring do the same. According to Singer, finding a nonglare floor sealant proved virtually impossible. "We found something close, but we still had to use steel wool to break the gloss," he says. "That's a challenge we would put out to the manufacturers."

The challenge of creating innovative materials, products, and processes, which was taken up by some of the manufacturers whose equipment is incorporated into the building (see page 117), is the surprising essence of the new main building at Millay. The simplicity of the solutions, some of which were easily found and applied and some of which required searching and stringent testing, are indicators of the current state of universal design. "There is still an incredible prejudice against universal design, and the idea is still prevalent that it will ruin the aesthetic value of a building," observes Singer. "This project dispels that notion." ■

**Sources**

**Wood siding:** *Novelty Siding*

**Wood windows:** *Marvin*

**Skylights:** *Velux*

**Entrances:** *Morgan Doors*

**Locksets:** *Schlage*

**Paints, stains:** *Benjamin Moore*

**Recyclable carpet:** *Interface Flooring Systems, Inc.*

**Office furniture:** *Herman Miller, Knoll*

**Wheelchair-accessible plumbing fixtures:** *Kohler*

**Universally designed kitchen appliances:** *Whirlpool Corporation*

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## PLACES OF WORSHIP

# Where We Seek the Light

### DAYLIGHT IS THE COMMON DENOMINATOR IN PLACES OF WORSHIP, NO MATTER WHAT THE RELIGION OR DESIGN STYLE. IT IS THE ELEMENT AROUND WHICH THE FAITHFUL UNITE WITH THEIR CREATOR.

**by Charles Linn, AIA**

1

**Hastings-on-Hudson, New York**

*After meeting in a concrete box–like building for almost 40 years, the congregation of Temple Beth Shalom has a light-filled, flexible new home.*

2

**Sarasota, Florida**

*Architect Carl Abbott's new parish hall and central courtyard for St. Thomas More Catholic Church complete a project he started a decade ago.*

3

**New Haven, Connecticut**

*The Joseph Slifka Center for Jewish Life at Yale explores the integration of religious architectural symbolism into a distinguished campus setting.*

4

**Seattle, Washington**

*Olson Sundberg Architects collaborate with artist Ed Carpenter to create a new west wall for the 70-year-old St. Mark's Cathedral in Seattle.*

Religion is inseparable from light—a form of energy that is life-giving, whose effects are tangible although it is invisible. Light is a symbol of the spirit of God to those who believe. It is no wonder. In the first book of the Old Testament, the Book of Genesis, God creates light before anything else. He separates light and darkness and calls them day and night, the notion of time being invented almost as a by-product. God makes light even before creating the sea, plants and animals, man and woman. That process takes up the whole first day of creation. In the New Testament, St. Matthew goes so far as to say that when Jesus began to preach, a light dawned on those who had been living in the shadow of death.

Likewise, light seems always to have been foremost in the minds of those who design places of worship. Whether they are believers or not, it is hard to dispute the extent to which architects have been inspired in the way they have designed temples, synagogues, mosques, churches, and cathedrals to receive, reflect, and temper light.

From a programmatic standpoint, it is easy to understand why light has been such an important element. Throughout most of the last two millennia, people needed daylight just to see what was transpiring in church. Yet it is hard to imagine that those who designed Notre Dame, for example, had only visibility in mind. The same is true for Le Corbusier's Ronchamp Chapel, Fay Jones's Thorncrown Worship Center, and thousands of other churches whose designers have used fenestration and color to create subtle combinations of direct and indirect light to enhance architectural form. The results seem to reach right inside people—drawing out the powerful invisible connection between the physical and the spiritual.

All four of the projects in this Building Types Study were constructed by people who were committed for a very long time to realizing their dreams of an ideal place to worship, and they were designed by architects who emphasized daylight in their designs. At St. Mark's Cathedral, in Seattle, Olson Sundberg Architects and artist Ed Carpenter constructed a huge rose window some 70 years after the building was completed. The interiors of both Temple Beth Shalom, designed by Edward Mills and Perkins Eastman, and St. Thomas More Catholic Church, recently expanded by Carl Abbott, are lit by generously sized clerestories. Roth and Moore's Joseph Slifka Center for Jewish Life uses a different device—a light court—to carry daylight into its below-grade dining rooms.

Regardless of the methods used, the architects of all of these buildings have created places where people can seek the light. ■

1

# Temple Beth Shalom Hastings-on-Hudson, New York

### A CONGREGATION'S DESIRE TO HOUSE CLASSROOMS AND WORSHIP SPACE TOGETHER WAS THE STARTING POINT FOR A NEW SYNAGOGUE.

**by Elizabeth Kubany**

**Project:** *Temple Beth Shalom, Hastings-on-Hudson, New York*
**Owner:** *Temple Beth Shalom*
**Architect:** *Edward I. Mills & Associates in joint venture with Perkins Eastman Architects—Edward I. Mills, FAIA, Bradford Perkins, FAIA, Aaron Schwarz, AIA (principals); Mauricio Salazar and Peter Hughes (project architects)*
**Consultants:** *Abe Joselow Consulting Engineers (mechanical and electrical); Feld, Kaminetzky, Cohen (structural); David Ferris Miller (landscape)*
**Construction Manager:** *John Karhu*

Though the conventions that govern the design of synagogues have changed in recent years, many of those constructed in the United States during the past 50 years follow a similar approach: religious areas are housed in one wing and the education and administrative functions in another.

In 1992, when the congregation of Temple Beth Shalom of Hastings-on-Hudson, New York, decided they needed a new building, they wanted something different. Since the 1950s, the congregation had held its services in a 7,000-square-foot concrete box–like building; administrative and classroom spaces were housed separately on the site.

The congregation's list of needs was formidable: a minimum of 15,000 square feet to enable its membership to grow; a flexible space to accommodate numerous program elements and widely varying congregation sizes; and a structure that would respect the three-acre hillside site, which is adjacent to the old Croton Aqueduct. In addition, the congregation wanted the new temple to be a peaceful, light-filled place.

The congregation was working with a restricted budget and a tight schedule: the building had to be designed and built in less than two years for only $2 million (including site work and furnishings). A joint venture of the firms Edward I. Mills & Associates and Perkins Eastman Architects was selected for the job.

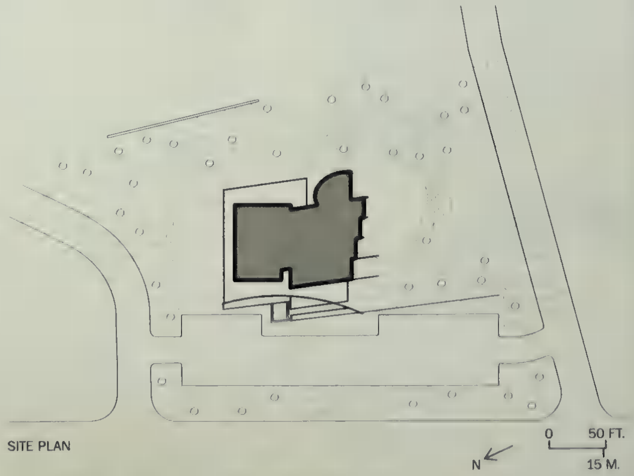
The architects' first task was to rethink the relationship between building and site. "The original building was simply a box stuck into the side of the hill," says Mills, "a common problem with steeply raked sites. How do you make the building feel like it is sitting with the hill rather than against it?"

The building mass has been organized to reflect and defer to the topography of the site and to emphasize a sense of procession, from the entry on the ground level to the sanctuary on the upper level, which contains the tallest spaces in the building. "From the beginning, we used the topography to make the building; we spent a lot of time working out the procession," explains Aaron Schwarz, a partner with Perkins Eastman.

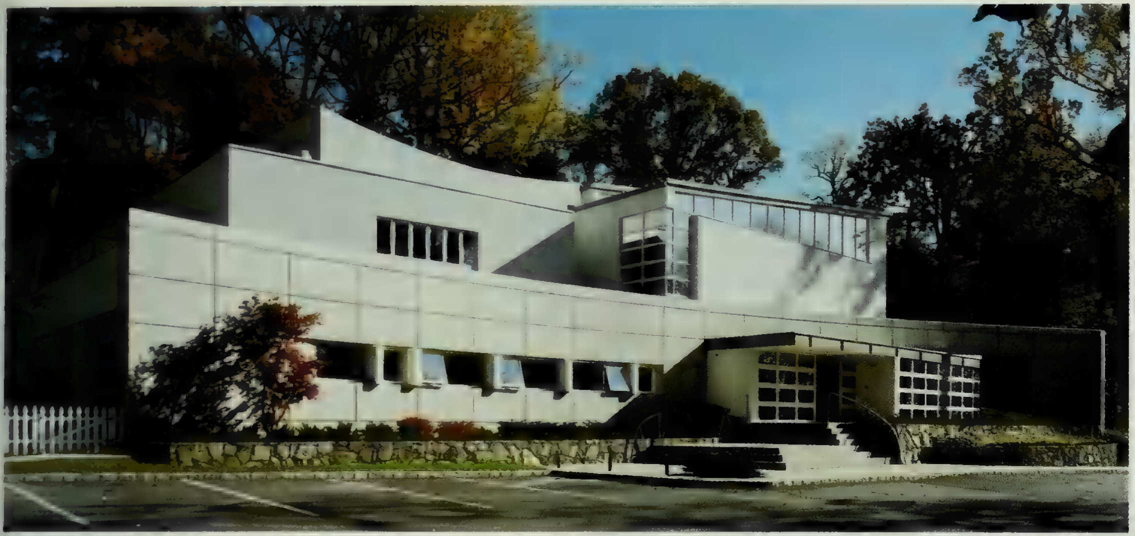
The architects ramped the parking lot to accommodate a four-foot grade change from the bottom to the top, where a set of exterior stairs leads to the entrance. A poured-in-place concrete wall curves to welcome the visitor. An angled canopy and a large bronze door further punctuate this important entry.

Besides forming the entrance facade, the entry wall also establishes a datum line that extends into a plinth to form the lower story. This story supports the primary

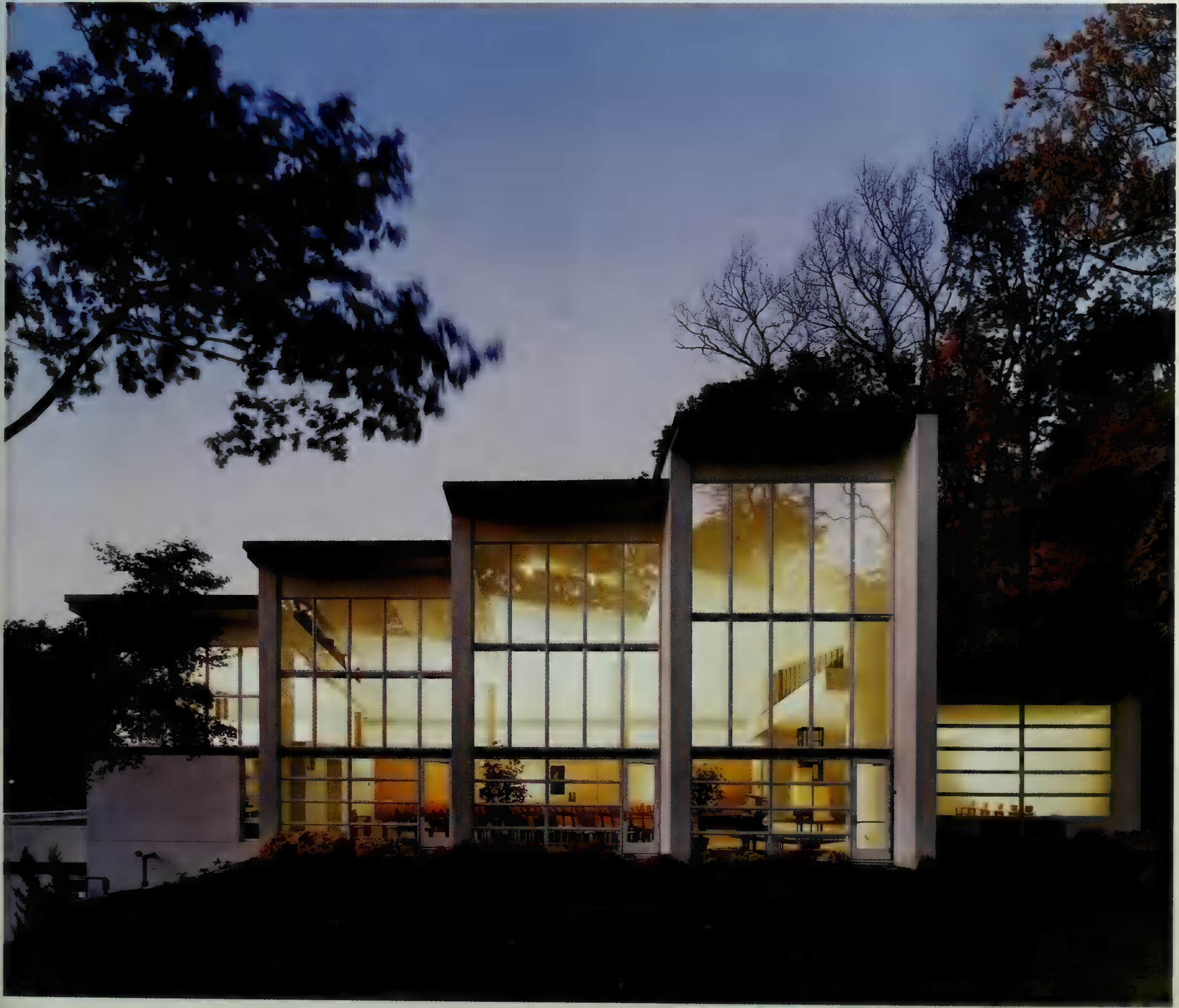
*New York City writer Elizabeth Kubany is an occasional contributor to ARCHITECTURAL RECORD.*

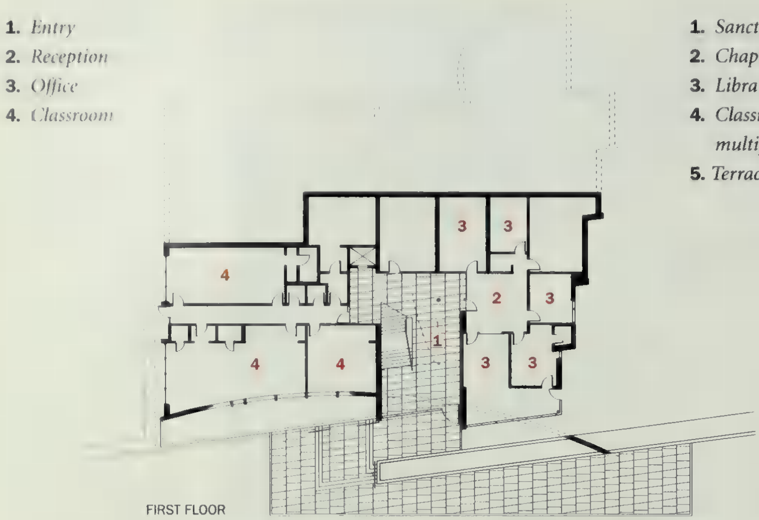


SITE PLAN

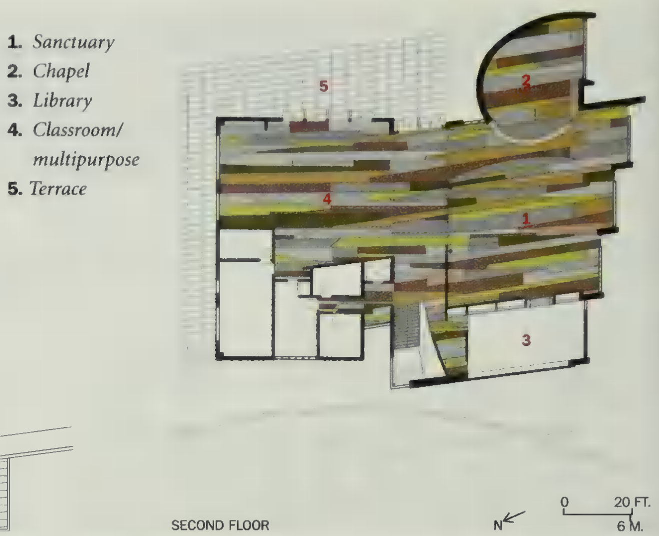


The arcing entry wall (left) establishes a datum line that forms the base of the building. Changes in the ceiling height on the second level (below) mimic the topography of the site, reinforcing the relationship between the synagogue and the hill it is built on.

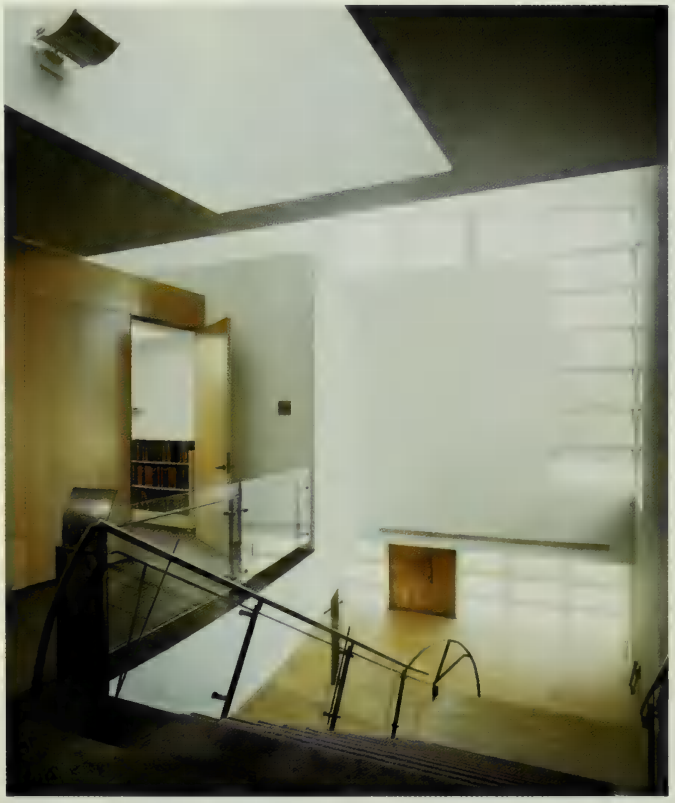




FIRST FLOOR



SECOND FLOOR



**A glass, steel, and concrete staircase is part of the procession of hierarchically arranged spaces, from the first-floor entry, leading to offices and classrooms, to the second-floor sanctuary.**

building mass, which houses the sanctuary.

Inside, a set of vertical windows and a clerestory window illuminate the entry hall, which allows passage to offices and classrooms on the ground floor. A sculptural granite-and-steel staircase leads from the entry hall to the second level.

The upper level is flexible and versatile. The sanctuary can be configured to take up almost the entire second floor or only a small part of it. Flexibility is critical because the congregation can vary in size from only a dozen worshippers to hundreds during the High Holidays. Movable partition walls, some premanufactured and others constructed on site by a metalworker, allow multiple configurations: one large room, three separate rooms (a sanctuary, a classroom, and a multipurpose space), or a combination of these.

Regardless of how the space is configured, south-facing windows bathe the entire sanctuary in bright light. Openings in the trusses that span the sanctuary have been glazed to form clerestories. These windows allow western light to shine on the bimah, a platform that holds the Torah, and enliven the space by dividing it into five bays. The western bay, separated from the sanctuary, can be used as a library; three bays in the center (the tallest being 35 feet high) form the bulk of the sanctuary; and a short chapel-like bay at the eastern end normally holds the bimah.

When the large multipurpose room is opened up to the sanctuary to accommodate a large gathering, the congregation faces south instead of east. The architects designed the bimah so it could be relocated for these occasions. In most synagogues the Ark is located behind the bimah; here a freestanding 25-foot rotating Ark—a cubist composition of steel and wood that holds three Torahs and the eternal light—serves both arrangements.

Mills stresses that "there was no money to spend on finishes." Besides the Ark, the lectern, and the staircase, Mills designed a custom carpet for the entire upper level in a geometric pattern that resembles the local fieldstone.

The end result of this difficult building program is, according to Rabbi Edward L. Schecter, a synagogue that "functions so well we can do everything we want to." ■

**Sources**

**Windows and curtain wall:** *Hurd*
**Built-up roofing:** *G.A.F.*
**Lay-in ceilings:** *Armstrong*
**Paints and stains:** *Benjamin Moore*
**Plastic laminate:** *Nevamar*
**Custom carpeting:** *Shaw Carpet*
**Lighting:** *Halo, Edison Price, Litecontrol*

**The pattern of the carpet on the second floor (plan left), custom designed by architect Ed Mills, is influenced by the local fieldstone. The small chapel (right) is the normal resting place for the custom-designed bimah (below), which holds the Torah for reading. The Ark (right), seen to the right of the bimah, holds three Torahs and the eternal flame. During the High Holidays, the anigre-veneer partitions can be opened and the seating rearranged to allow for a larger congregation. On these occasions, the locations of the bimah and the Ark are adjusted to maintain the proper orientation.**

2

# St. Thomas More Catholic Church Sarasota, Florida

## TEN YEARS AFTER THE ORIGINAL CHURCH WAS BUILT, THE SAME ARCHITECT DESIGNS A NEW PARISH HALL AND COURTYARD.

**by Beth Dunlop**

**Project:** *St. Thomas More Catholic Church, Sarasota, Florida*

**Client:** *Father Eugene Ryan, Ray Haddad, Frank Faga for the Diocese of Venice*

**Architect:** *Carl Abbott, FAIA, Architects/Planners—Carl Abbott, principal-in-charge of design; Gregory Hall, AIA, project manager; Cooper Abbott, planner; Michael O'Donnell, project manager*

**Consultants:** *Willy Malarcher (liturgical)*

**Engineers:** *New parish center—Stirling Wilbur (structural); A.M. Engineering (civil); A. J. Sanchez (mechanical/electrical)*

*Existing church—A. L. Conyers (structural/civil); W. R. Frizzell (mechanical/ electrical)*

**Contractor:** *Halfacre (new parish center)*

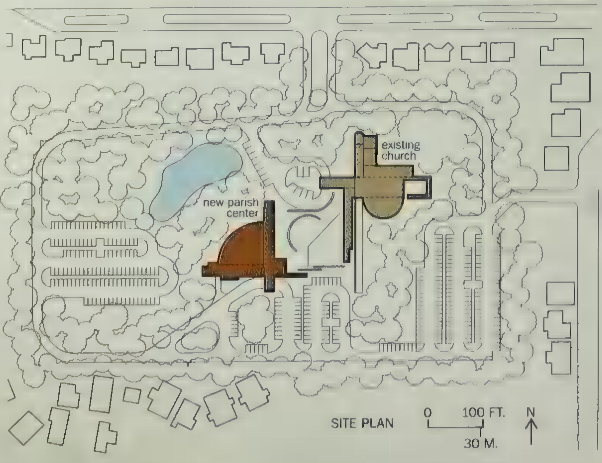
St. Thomas More Catholic Church sits on 20 wooded acres in suburban Sarasota. Though the site is surrounded by houses on all sides, the church is completely obscured from view, as if it were literally a church in the pine forest. Indeed, the intent of the architect, Carl Abbott, FAIA, was "to do a building that was quiet in its environment yet had a certain kinetic energy as well."

To get to the church, one parks at the periphery of the grounds and walks through the Southern slash pines and saw palmettos, the native landscape of the Florida Gulf Coast. The church is low slung and has no steeple, deferring to the trees that reach high above the roofline. In keeping with the environment, it is not white but a silvery gray that resembles the trunk of a royal palm tree, and is clad in a heavily textured blown-on stucco, perhaps to give it a barklike texture.

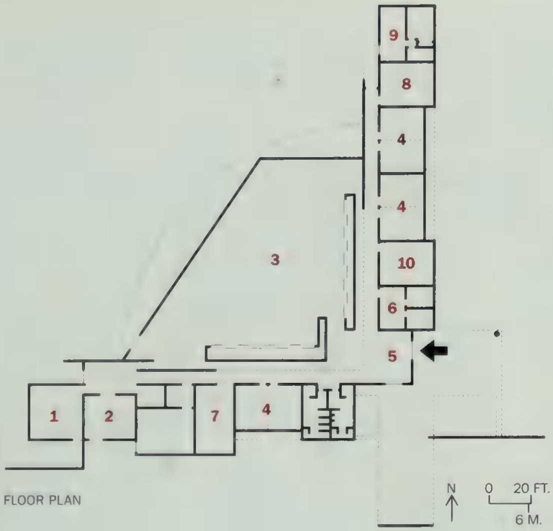
While the church complex does offer a respite from the world, it is also a center of activity. The parish has become one of the biggest and busiest in Sarasota, drawing worshippers from a wide area. The original church—a sanctuary, a chapel, and a cloistered garden—is now a decade old; the parish hall and central courtyard, also designed by Abbott, were completed earlier this year.

Abbott was selected to design St. Thomas More in part because he was not a Roman Catholic. The congregation was beginning to use the Church's new liturgy and wanted an architect with few preconceptions about how the worship space should evolve. Abbott came to see the Mass as a kind of movable feast, one that may involve a certain amount of choreography, as worshippers visit the Stations of the Cross and walk up to receive the Eucharist. The church was designed

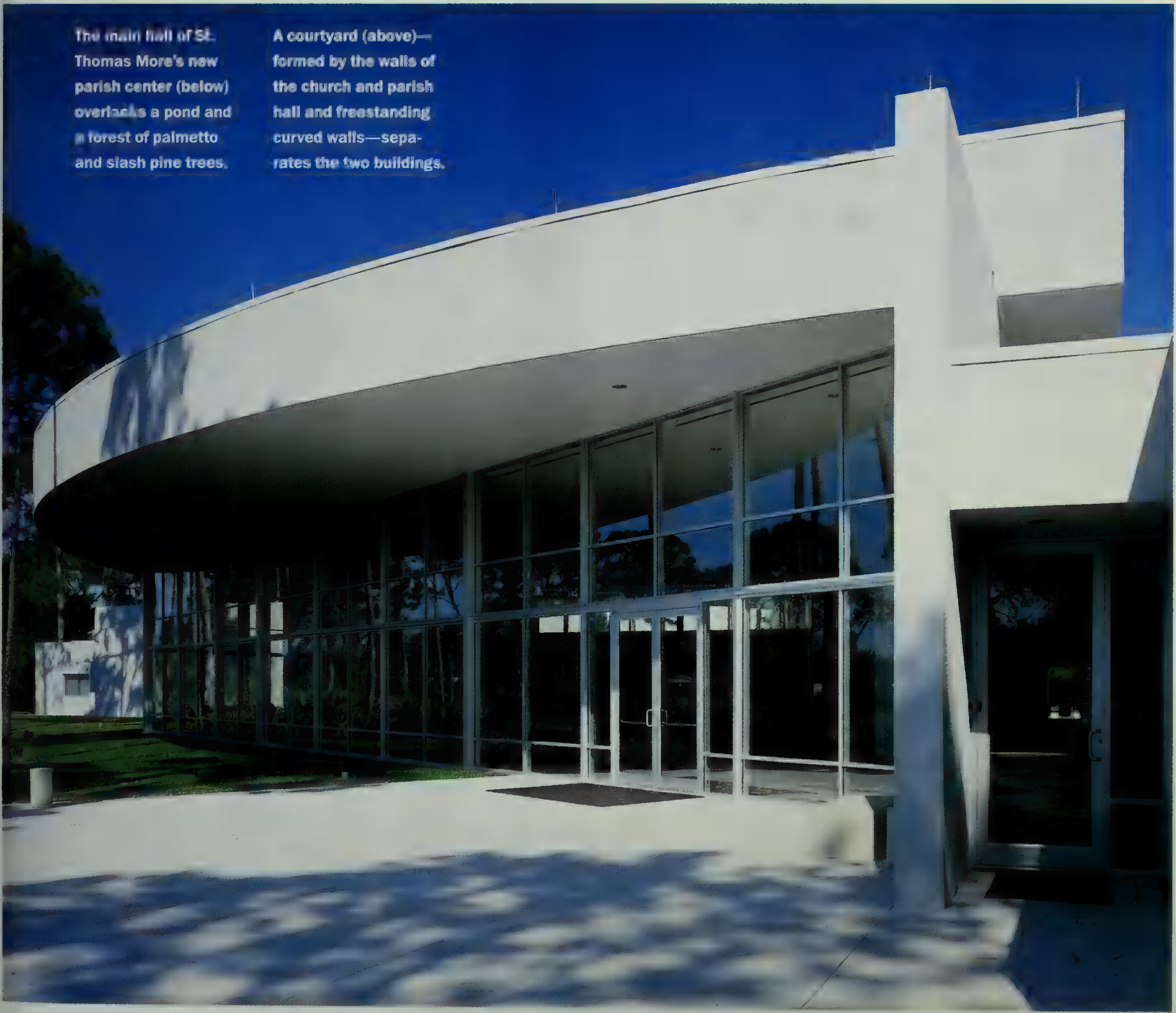
*Beth Dunlop is a contributing editor for RECORD and was the* Miami Herald's *architecture critic from 1979 to 1993.*



1. *Banquet room*
2. *Kitchen*
3. *Main room*
4. *Meeting room*
5. *Lobby*
6. *Office*
7. *Storage*
8. *Senior room*
9. *Apartment*
10. *Youth room*



FLOOR PLAN

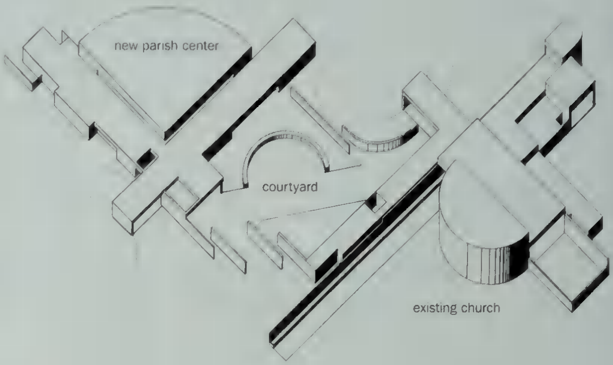


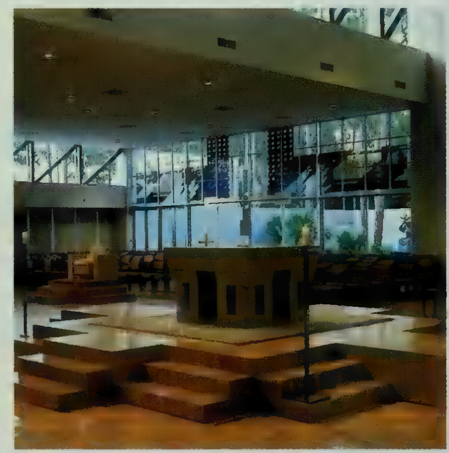
**The main hall of St. Thomas More's new parish center (below) overlooks a pond and a forest of palmetto and slash pine trees.**

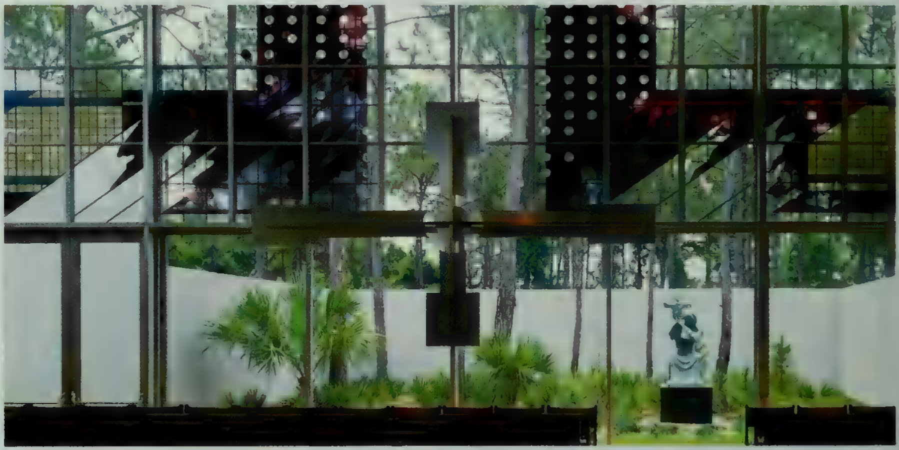
**A courtyard (above)—formed by the walls of the church and parish hall and freestanding curved walls—separates the two buildings.**

## AN EVOLVING CHURCH IS EXPRESSED BY RIGID FORMS SET WITHIN CHAOS

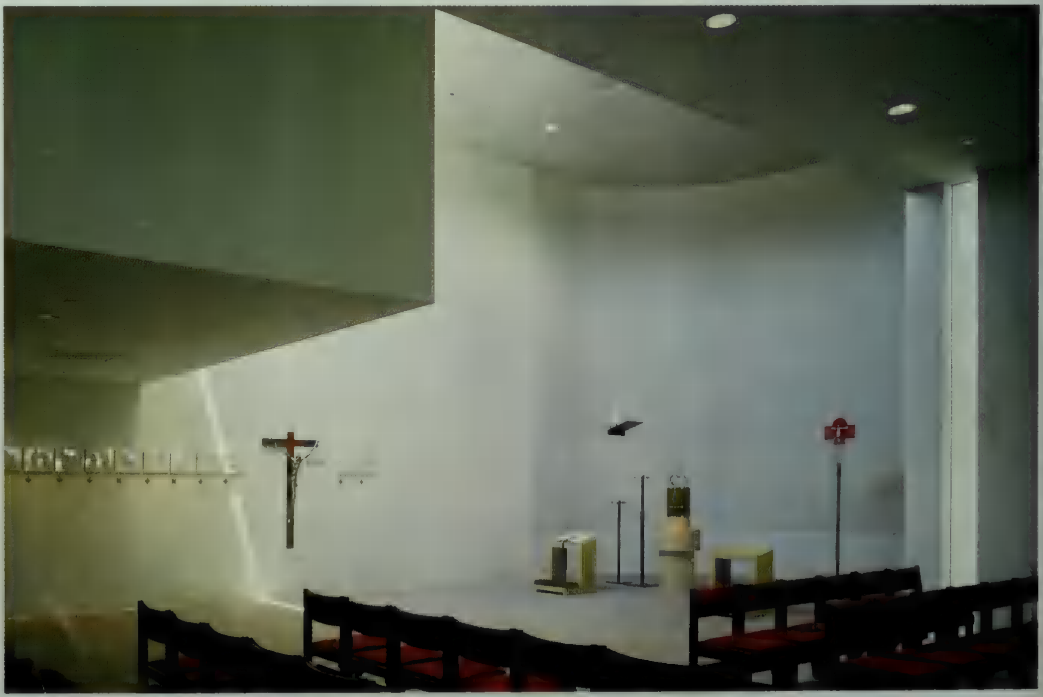
Both the original church (right in axonometric) and the new parish hall (left in axonometric) are pieced together from rigid geometric forms. Architect Carl Abbott intended for the design of the church, built 10 years ago (photos this page), to provide a sense of order and structure amid the uplifting but randomly spaced trees on the site. Taken together, the church's forms, set in an environment of natural chaos, symbolize the stable but ever-changing Catholic church. The main sanctuary, which can accommodate as many as 850 worshippers, is an exercise in simple geometry, a half-circle linked to a half-square, and functions as a kind of theater-in-the-round. Abbott knew that the space needed to be flexible enough to embrace the evolving needs of the church liturgy. Merging the half-circle and half-square seemed appropriate: it was a nod to the apsidal church narthexes of the past but inflected by the crispness of modern geometry. *B.D.*



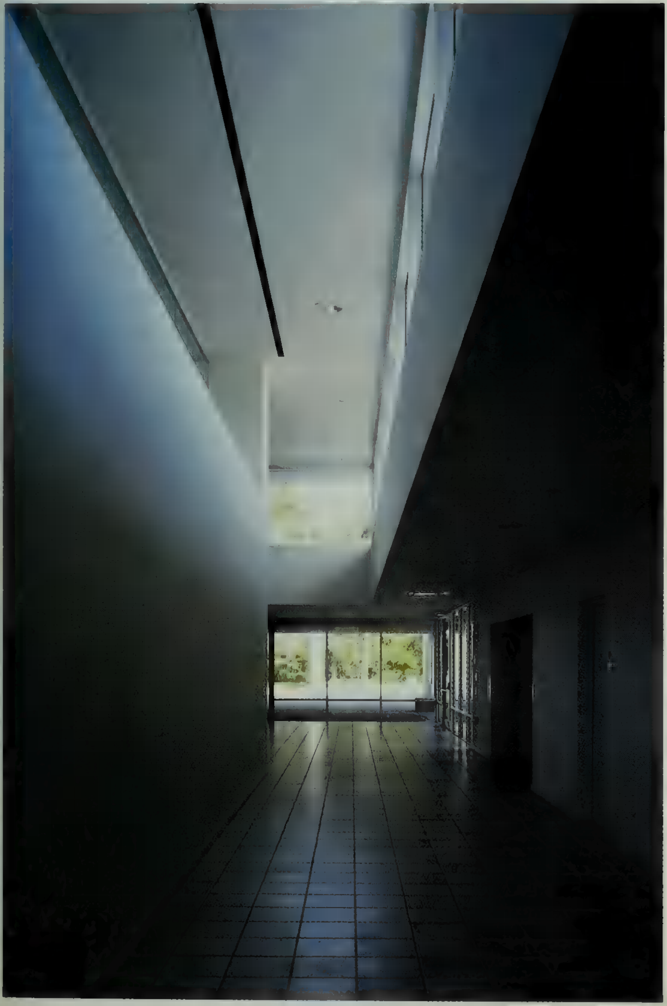




**The altar in the main sanctuary is placed on a cross-shaped platform (above). To one side of the narthex is a cloistered garden (above right), which refers to a historical sacred space but is designed and positioned in an unexpected manner. The semicircular chapel altar (right), at the end of a 240-foot-long processional walkway, contains the reserved Eucharist and is lighted by clerestory windows.**



The floor-to-ceiling windows of the parish hall's main room provide views of the pond and church grounds. The space can seat as many as 1,000 people.



An interior corridor in the new parish hall (above), which leads from the main room to a series of meeting and classrooms, is illuminated by clerestories. These windows relate to those in the original church, built 10 years earlier.

after numerous personal conversations with the priest and many parishioners, as well as an open forum. Churchgoers asked Abbott for a design that would reflect the Catholic faith's new freedom and modernity; they wanted a church that would welcome and embrace them, not an untouchable monument set apart by ritual and longstanding church roles.

The church stood alone for almost a decade until the diocese was ready to add the supporting spaces. At that point the full plan began to take shape. Abbott looked at a number of larger churches and found them dark and self-contained, which didn't seem appropriate in Florida's sunny climate. Instead, he chose to position the parish center so as to create a courtyard that would be "the heart of the whole complex." Large and walled, the courtyard is at once a link between the two buildings and its own entity. Some walls are formed by the building facades; others are freestanding, in the tradition of Luis Barragan. Both straight and semicircular walls appear in the courtyard.

The design of the parish hall, used for meetings, social events, wedding receptions, and other ancillary functions, is a variation on the church's simple geometry. In plan, two rectangular bars, which house offices and support facilities, embrace the main hall, a precise quarter-circle in form. Abbott used basic building materials—concrete, stucco, and glass—and a restrained design so as not to compete with the natural landscape.

He also made the most of the opportunity to use light as an architectural element, to provide a sense of both repose and celebration. In the sanctuary and the chapel, he says, the light is "contemplative and reflective," while the parish center is "sparkling with direct sun—active and energetic." Where he wanted infusions of light and views, Abbott used window walls. The curved facade of the parish center, for example, looks out onto a small pond (built for water attenuation but used in a picturesque manner).

Creating successful adjuncts to existing buildings is, in a way, not unlike designing ideal marriage partners. At St. Thomas More, the old has been joined to the new by making forms and materials compatible and by repeating common themes, such as the use of clerestories throughout to bring light into the spaces. ■

**Sources**

**Windows, glazing, and entrances:** *Kawneer Company*

**Hardware:** *Schlage Lock Company*

**Acoustical ceilings:** *Armstrong World Industries*

**Demountable partitions:** *Modernfold*

**Paints:** *Sherwin-Williams*

# 3 Joseph Slifka Center for Jewish Life, Yale University New Haven, Connecticut

## BOTH SYMBOLICALLY AND FUNCTIONALLY, A NEW JEWISH CENTER COMBINES A SENSE OF COMMUNITY WITH OPENNESS TO THE WORLD.

**by John Morris Dixon, FAIA**

**Project:** *Joseph Slifka Center for Jewish Life, Yale University, New Haven, Connecticut*
**Owner:** *Friends of Yale Hillel Foundation*
**Architect:** *Roth and Moore Architects—Harold Roth, FAIA, William Moore, AIA, partners-in-charge; Randall Luther, David Thompson, George Clemens, Lawrence Odfjell, Amy Beierle, David Roth, design team*
**Consultants:** *Spiegel Zamecnik & Shah (structural); BVH Engineers (mechanical and electrical); Jack Curtis & Associates (landscape); Cavanaugh Tocci (acoustical)*
**General Contractor:** *Stone Building Company*

Only a few decades ago, the very presence of Jewish students on Ivy League campuses was hotly debated. And until recently campus Jewish organizations typically met in makeshift quarters. But the last few years have seen the construction of Jewish centers at Princeton (Robert A.M. Stern Architects, 1993), Harvard (Moshe Safdie and Associates, 1994), and Dartmouth (R. M. Kliment & Frances Halsband Architects, 1997). At Yale, architect Harold Roth, FAIA, a partner at Roth and Moore Architects, has been involved in planning the Joseph Slifka Center for Jewish Life for more than 30 years, a long, beneficial gestation period.

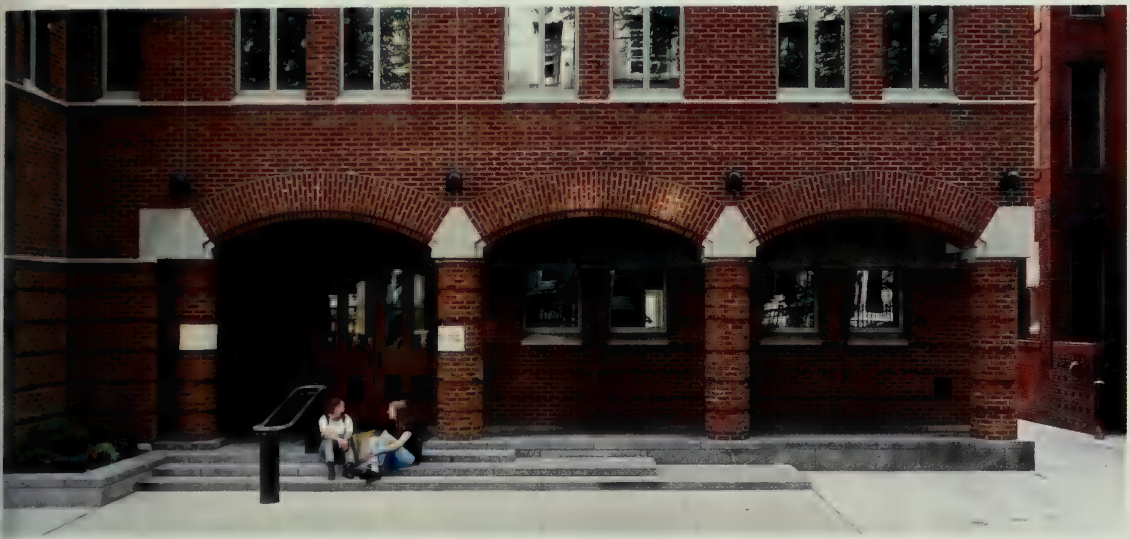
The design of such a building raises complex questions of both function and symbolism. The center has to serve as a place for worship, social gathering, study, cultural events, and kosher food service. For its constituents, who differ widely in religious practices and lifestyles, the building serves a great variety of needs. Every week, the center accommodates services for Orthodox, Conservative, and Reform groups simultaneously.

To the rest of the university, a Jewish center represents one of many groups whose traditions both enrich and divide the community. How distinctive should such a building look? How anonymous? How closed or how welcoming? Is there any appropriate way for it to look Jewish?

The Slifka Center's director, Rabbi James Ponet, a 1968 Yale graduate, wanted above all to avoid an image of isolation. He is satisfied that his building is welcoming to all, and that those who come here will "know they're at Yale." Actually, the building is on land leased from Yale and was built by an independent nonprofit group. (In a creative funding strategy that could be applicable to other university-linked structures, contributions to the center were counted toward Yale alumni fund goals, but only for a limited period, thus encouraging timely donations.)

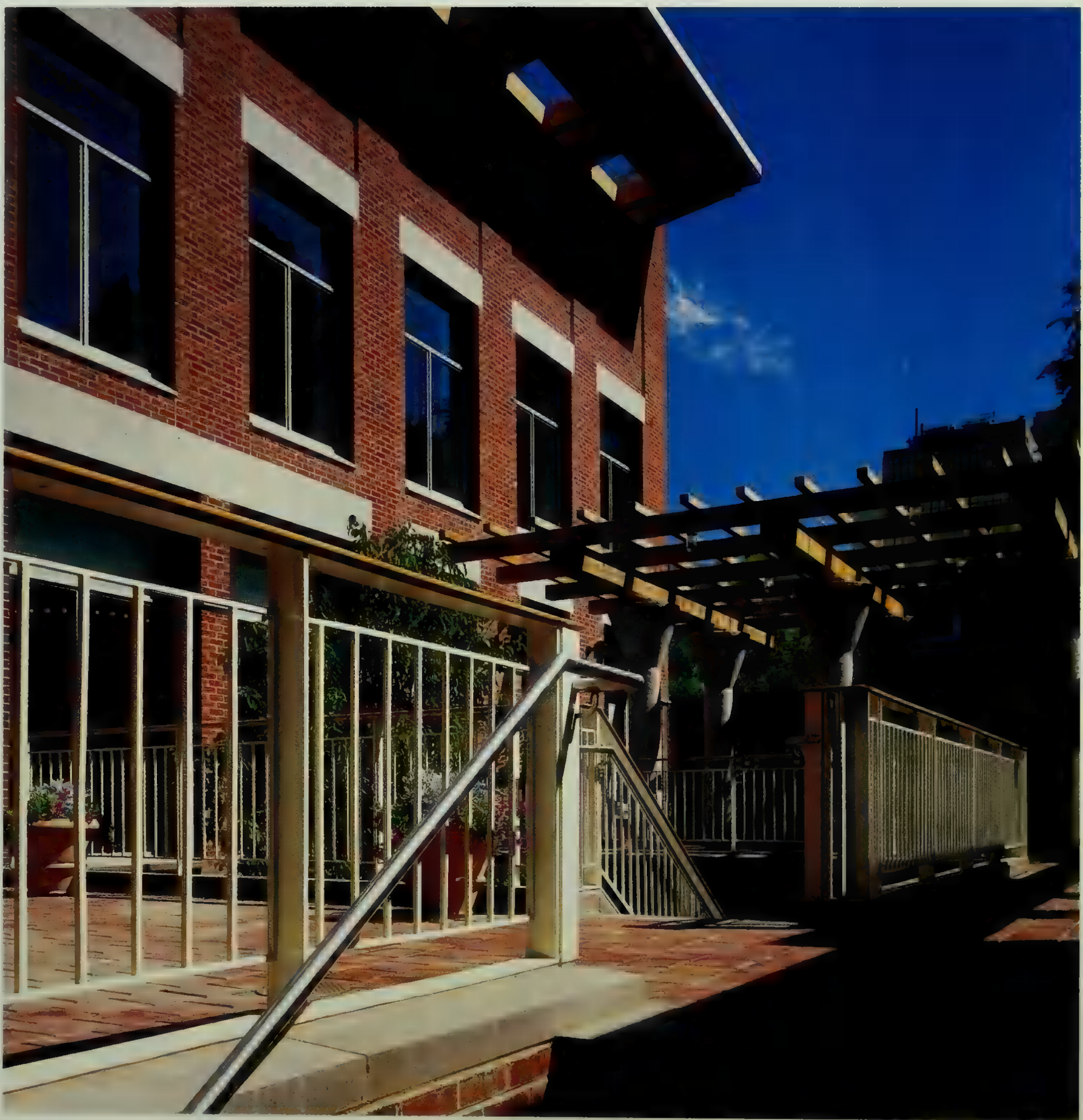
The new structure is set off subtly from the modest Federal- and Italianate-style red brick

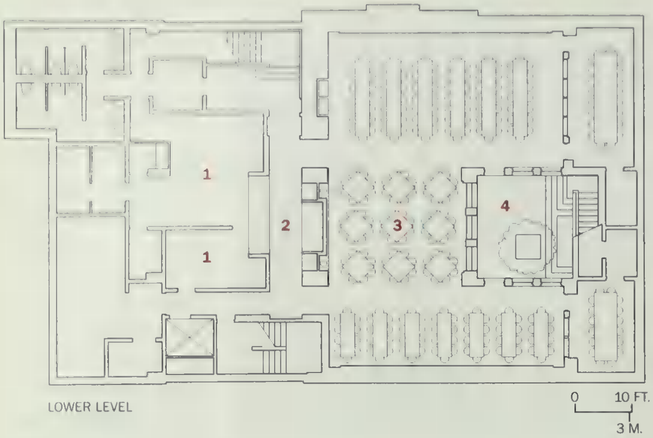
*John Morris Dixon, FAIA, was the editor of* Progressive Architecture *from 1972 to 1996.*



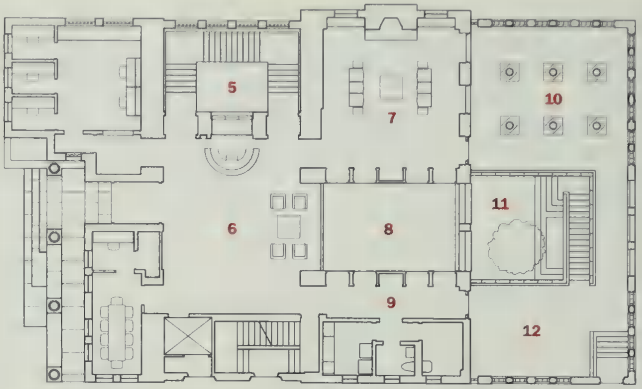
The building's brick walls continue the predominant material on this small-scaled streetscape (opposite). Bold cast-stone elements recall Yale's more monumental buildings and suggest the building has an institutional purpose. The setback and the arcade (left) provide a transition from the street; the arcade covers a low-slope ramp.

The sukkah (right) is a permanent framework for the outdoor shelter used in the Sukkoth harvest festival. Here it fulfills a ritual purpose while also serving as a trellis for one of the building's south terraces. Because all materials used in a sukkah must be natural, wood columns are concealed in concrete, and the beams are solid redwood.



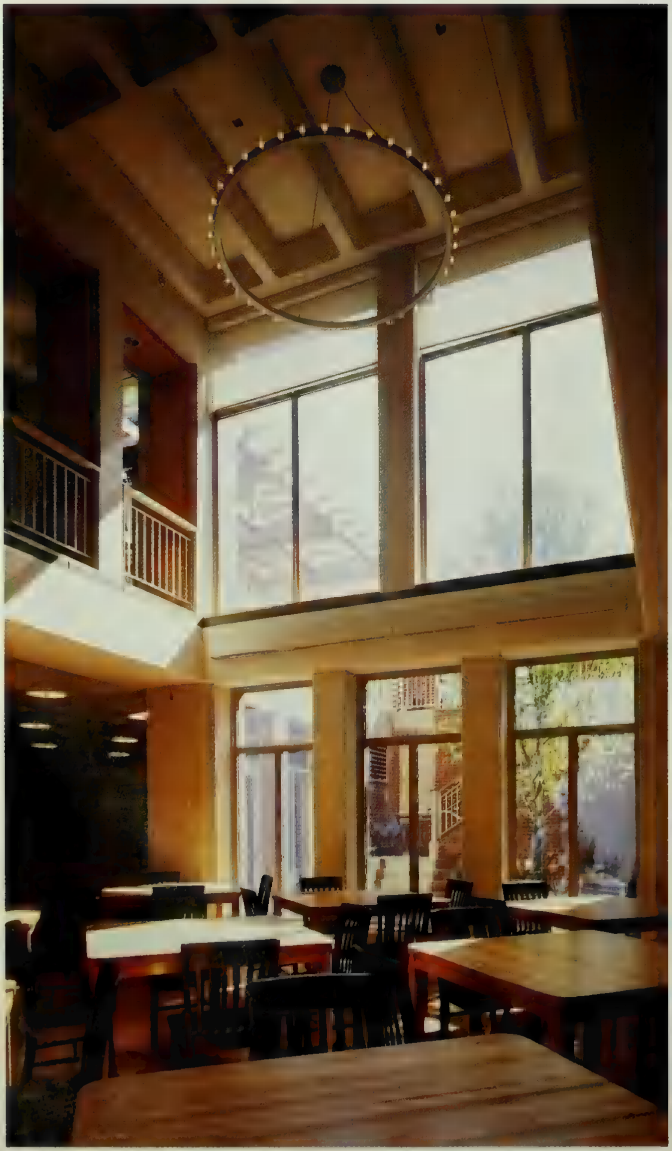


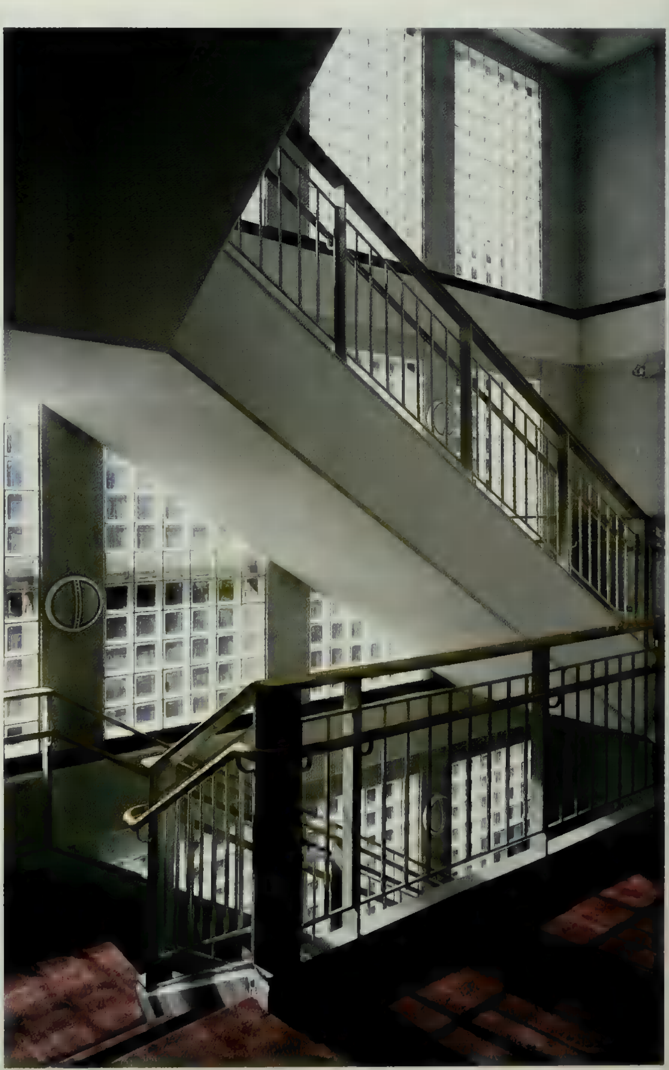
LOWER LEVEL



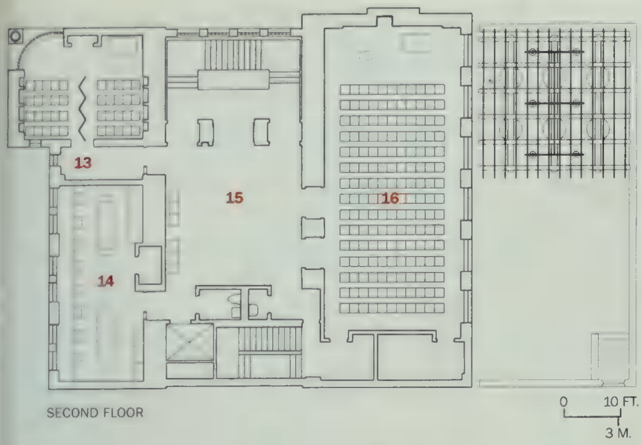
FIRST FLOOR

1. *Kosher kitchen*
2. *Servery*
3. *Dining room*
4. *Garden court*
5. *Reception*
6. *Lobby*
7. *Living room*
8. *Open to dining*
9. *Gallery*
10. *Sukkah*
11. *Open to garden*
12. *Terrace*

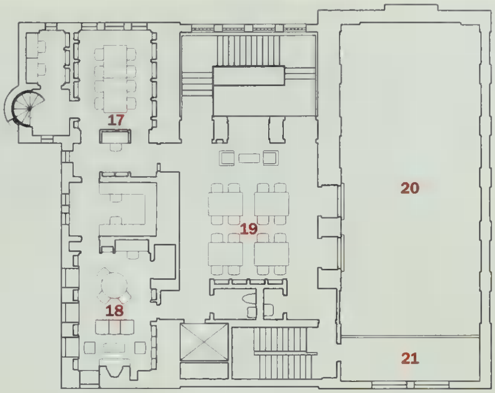




**The dining room (left) and the main stairway between the lobby and study lounge (above) have large glazed openings that allow a generous amount of daylight to flow into the building.**

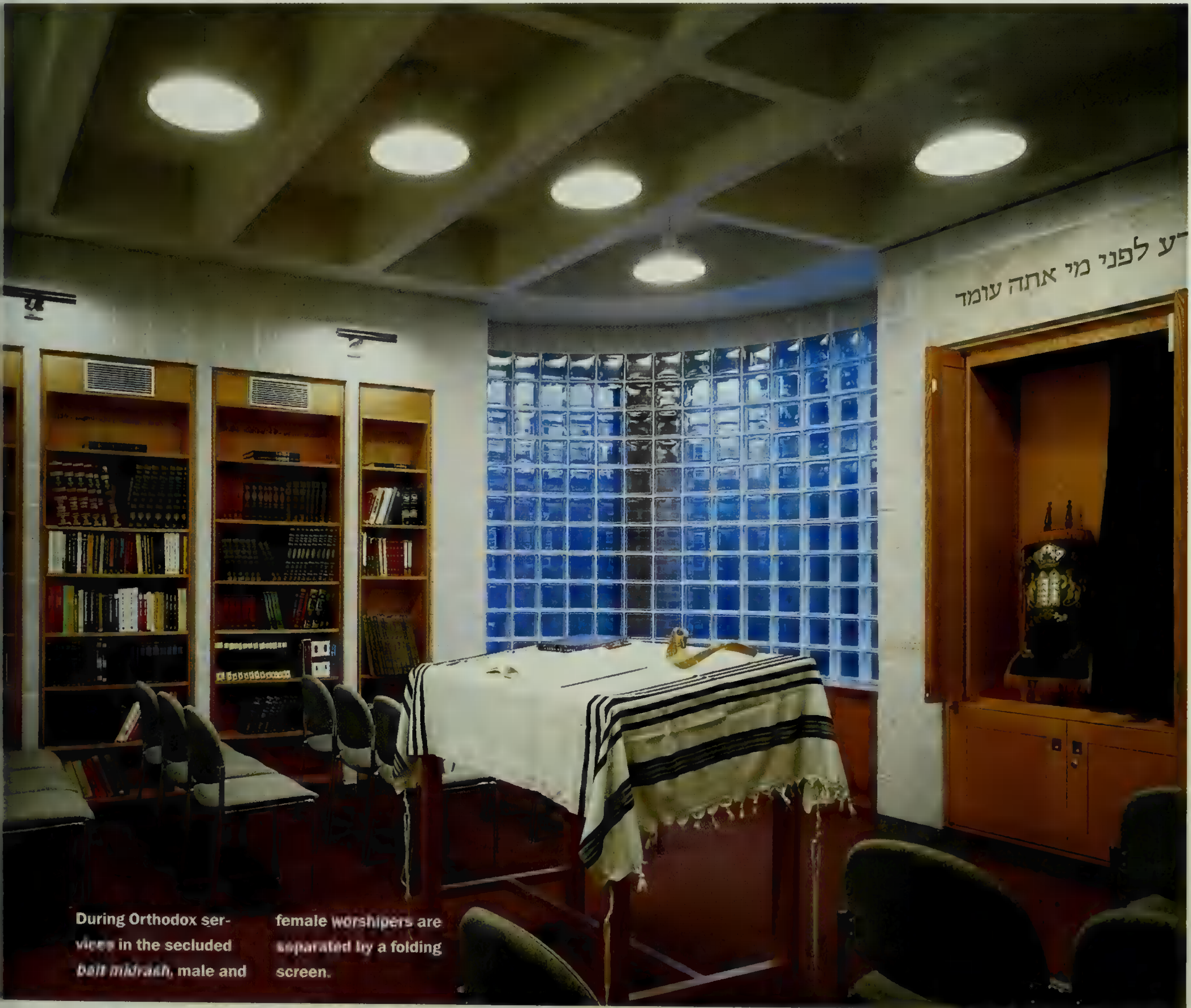


SECOND FLOOR



THIRD FLOOR

**13.** *Bait midrash*
**14.** *Student programs*
**15.** *Lobby*
**16.** *Multipurpose room*
**17.** *Library*
**18.** *Rabbi's study*
**19.** *Study lounge*
**20.** *Open to chapel*
**21.** *Balcony*



During Orthodox services in the secluded *bait midrash*, male and female worshipers are separated by a folding screen.

**The sukkah (far left) as seen from the west entrance of the terrace. The garden court (left) is adjacent to the dining room on the lower level of the building. The library (below) offers a quiet respite for study, while the multipurpose room (opposite) is used for dances, lectures, movies, and Conservative sabbath services.**

buildings that flank it. Recognizing that it will be approached sidelong down a narrow street, Roth has given depth to the building's facade: part of it is brought out to the sidewalk line and the rest is set back a few feet; a low arcade is carved out in front to provide space for socializing. Squat columns, brick arches, and inserts of cast stone recall Yale's prevailing Gothic Revival fabric while also alluding to the Middle Eastern origins of Judaism.

Before even reaching the glazed entry doors, the visitor can see that there is an open interior, flooded with daylight from the south-facing rear wall. Inside, a series of distinct but visually interconnected spaces are arranged around a central lobby. Straight ahead, the floor drops away to reveal the expansive, light-filled dining hall below. A reception desk stands discreetly to one side, near a broad, daylit stairwell that connects all four levels.

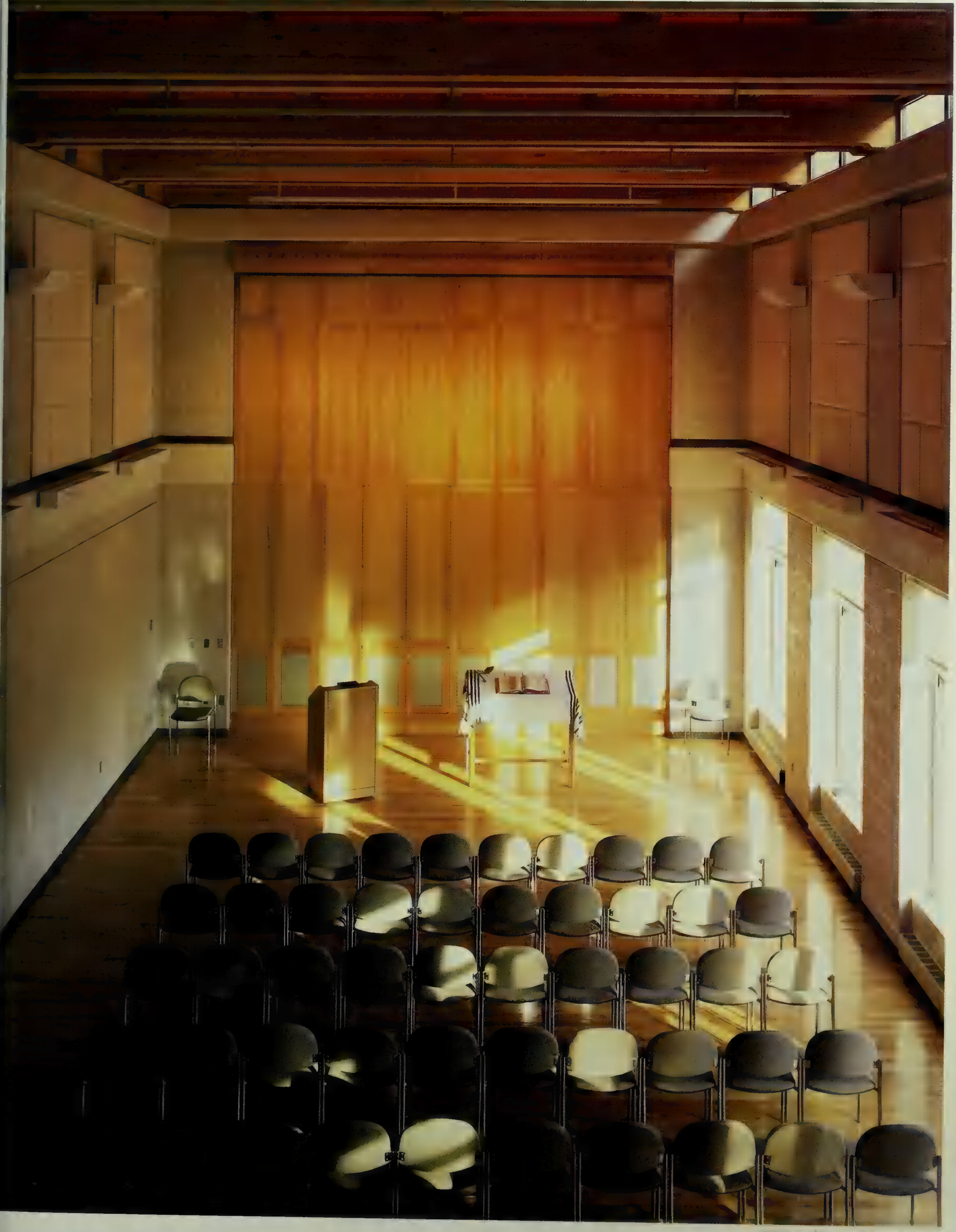
A sense of solidity was clearly a primary criterion for the interior. During the value-engineering phase, the architects and the chief benefactors successfully defended such elements as the ground-face block interior walls, the expanses of hardwood paneling, and the coffered concrete floor slabs, arguing that they were necessary for programmatic reasons: the massive floors, along with the heavy hardwood doors and shutters that can close off rooms, make it feasible for Israeli folk dancing and quiet discussions to go on in adjoining spaces.

Durability is also a vital quality, since the building has attracted large numbers of users, some Jewish and some not. The dining room draws many people who had never frequented the kosher kitchen in the building that previously housed the Jewish center. In addition, the building is a popular location for lectures, concerts, and social events, some sponsored by non-Jewish groups.

The Slifka Center for Jewish Life combines a sense of community for its users with a feeling of openness to the world. Its envelope is tough yet permeable, the interior dignified but open. It is a building prepared to play a positive long-term role in the overall life—not just the Jewish life—of a great university. ■

**Sources**

**Windows:** *EFCO Corp.*
**Skylights:** *Wasco Products*
**Fire doors:** *Cornell Iron Works*
**Hardware:** *Sargent*
**Acoustical tile:** *USG Interiors*
**Suspension grid:** *USG Interiors, Donn Fineline*
**Quarry floor tile:** *Dal-tile*
**Carpet:** *Lees, Stratton*
**Exterior lighting:** *Bega*



## 4

# West Wall, St. Mark's Cathedral Seattle, Washington

### A NEW ROSE WINDOW, BY OLSON SUNDBERG ARCHITECTS, CREATES A MAGICAL PLAY OF REFLECTED LIGHT.

**by Sheri Olson, AIA**

**Project:** *West Wall, St. Mark's Cathedral, Seattle, Washington*
**Owner:** *St. Mark's Cathedral*
**Architect:** *Olson Sundberg Architects—Jim Olson, principal; Stephen Yamada-Heidner, project manager; Steve Kern, Brooks Brainerd, Kevin King, Joe Iano, project team*
**Artist:** *Ed Carpenter*
**Consultants:** *Coughlin Porter Lundeen (structural); KPFF—Robert Grummel (structural engineer for altar screen glazing); The Greenbusch Group (mechanical); Michael Yantis & Associates (acoustical); Eskilsson Architecture (specifications); Wiss, Janney, Elstner (building envelope); Lightcrafters (lighting)*
**Contractor:** *Sellen Construction Company*

During early evening services, weddings, and concerts at the 70-year-old St. Mark's Cathedral in Seattle, "The glare was so bad in the sanctuary that the congregation often wore sunglasses and hats to shield their eyes," says Jim Olson, FAIA, of Olson Sundberg Architects (no relation to the author). The intense sunlight is due to the cathedral's unique orientation: its altar is on the west, not the east like most churches, and its windows were not covered in stained glass.

This is just one of the unusual conditions addressed in the architects' master plan to renovate and expand the incomplete landmark by Bakewell & Brown. The Depression truncated the Neo-Byzantine design, stranding St. Mark's huge central transept without its intended spire, nave, or apse. As a result, the interior of the unfinished cathedral is a spare, almost austere, concrete box with grand proportions. "Our priority was to create a sense of transcendence while preserving the cathedral's simple majesty," says Olson.

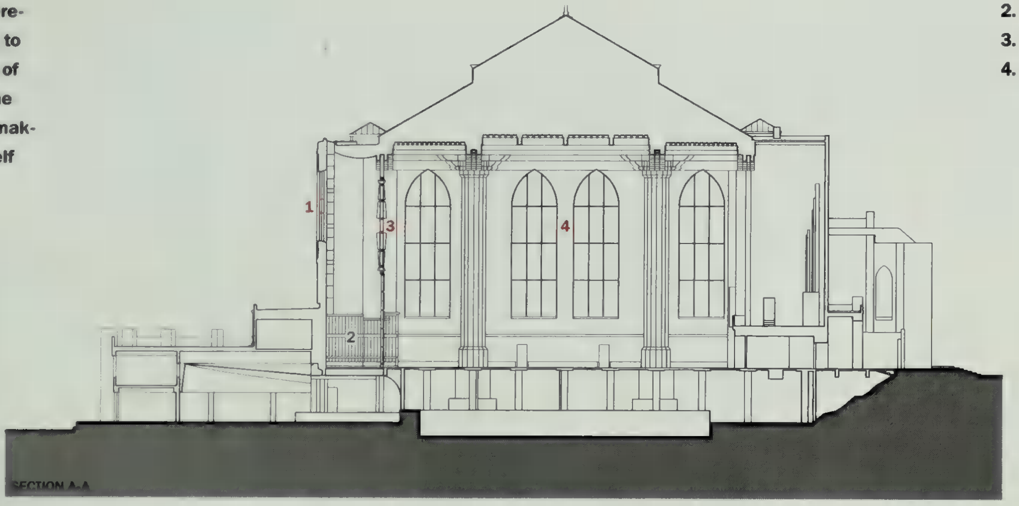
A diaphanous new 57-foot-high steel-and-glass altar screen now modulates the harsh light. Originally, the commission called for a rose window in the west wall with a separate reredos (altar screen). It quickly became apparent that the window size permitted by the structural constraints—and by the desire to limit western sun—would appear too small in the vast sanctuary. From this contradiction in scales a dramatic hybrid arose: a 21-foot-diameter circle cut in the exterior wall is aligned with a 28-foot-diameter "rose window" in a freestanding altar screen, which is placed 20 feet inside the church. Pulling these elements apart into distinct layers creates a small private chapel behind the reredos for prayer, meditation, or small ceremonies. Glimpses of a Celtic cross, which was once on top of the cathedral and is now relocated to the chapel, can be caught through the screen.

For the design of the reredos, Olson Sundberg called on a past collaborator, Ed Carpenter, a Portland artist known for his large-scale glass installations. With Carpenter the architects developed a simple scheme: a grid of 200 two-by-four-foot kiln-fused glass panels that serve as a backdrop for the abstract glass rose window above.

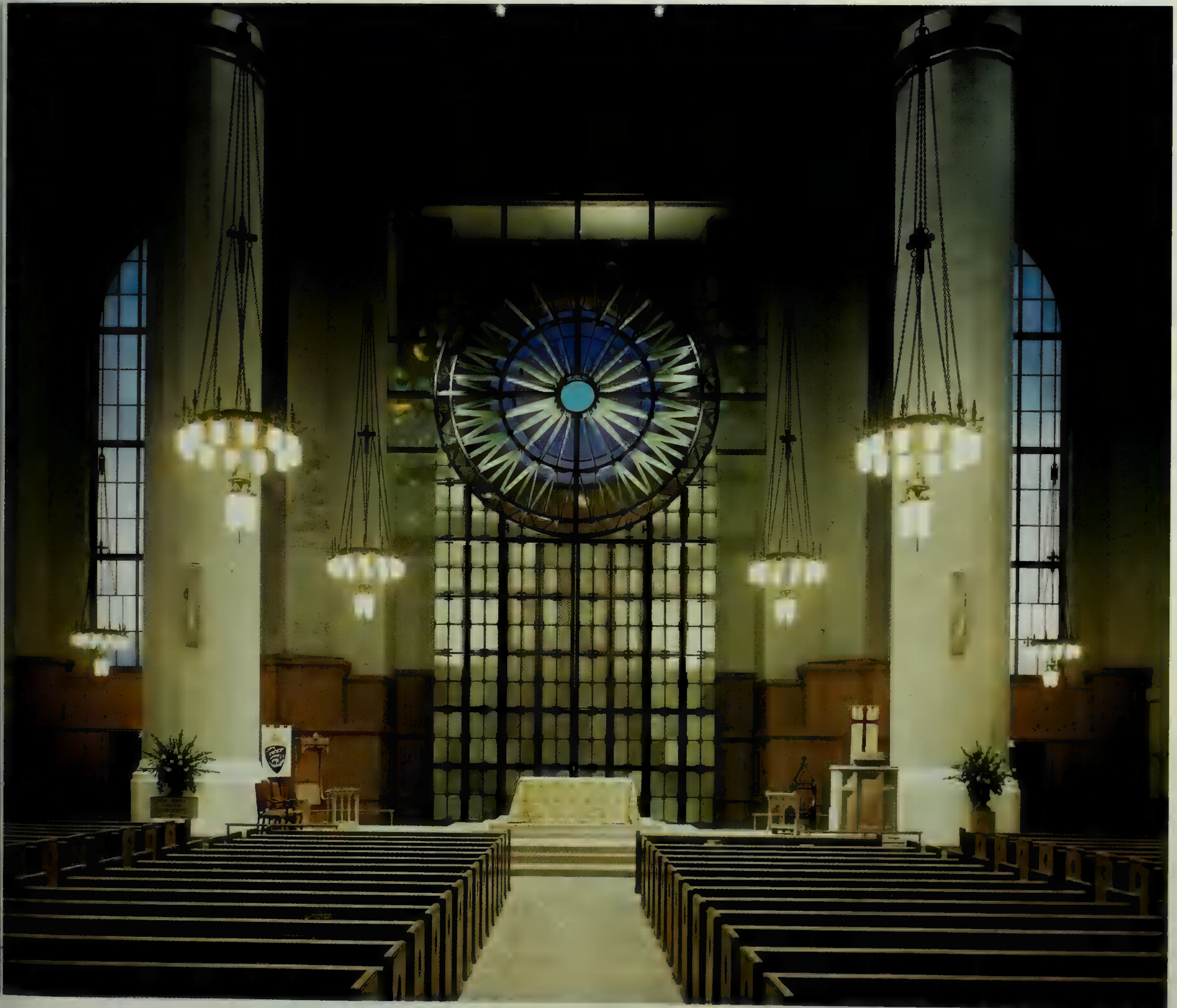
An engineered system of small metal clips attach the panels to the steel structure while allowing the glass to expand and contract. To achieve the desired texture and translucency for the lower panels, glassmaker Doug Hansen carefully weighed and then melted chunks of clear plate glass (the only way to ensure a consistent one-inch thickness). In contrast to the milky subtlety of the screen, the rose window is three concentric rings of

*Sheri Olson, AIA, is a writer and architect based in Seattle. She is a regular contributor to RECORD.*

The design of the new rose window and reredos arose as a way to control the amount of sunlight entering the sanctuary without making the window itself appear too small.



1. *New rose window*
2. *New chapel*
3. *New reredos*
4. *Existing cathedral*



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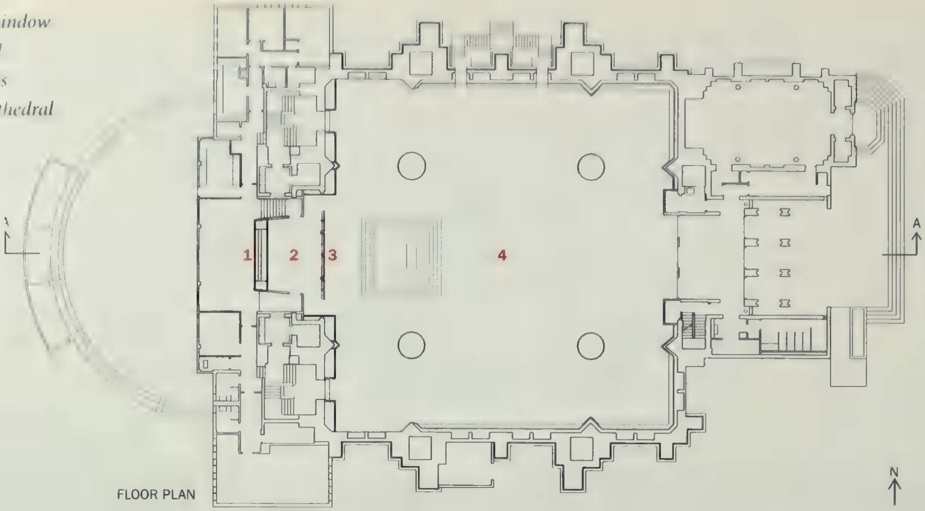

FLOOR PLAN

**Originally St. Mark's Cathedral was to be covered with stone, but due to the Depression, its concrete superstructure was left bare. The west walls of the church are the first to be clad in pale gray Indiana limestone; the rest of the church will be covered eventually.**

laminated glass panels; the two inner rings are clear, fritted glass; the outer is dichroic glass. Setting each of the panels on end exposes a knife-edge polished surface to the sanctuary, making the whole piece sparkle and enhancing its three-dimensional quality. Angling the glass also optimizes the kaleidoscopic colors produced by dichroic glass when light interacts with its surfaces. "It's a beautiful effect, but we limited the amount of dichroic glass because too much can get gaudy," says Carpenter.

St. Mark's sanctuary already had remarkable acoustics—perfect for choral concerts and organ recitals from the large Flentrop organ—so it was of special concern that the new altar screen not damage this quality. The danger was that the small chapel formed by the screen within the large volume of the sanctuary might dampen the acoustics, deadening the overall sound. Working with acoustical engineer Michael Yantis, Olson Sundberg subtly angled the back walls of the chapel and increased the spacing between the individual glass panels, allowing the screen to "acoustically breathe."

Camouflaged within the overall composition of the screen is a pair of 28-foot-tall doors that open and shut for acoustical fine tuning. While not part of the original program requirements, the congregation now finds the doors indispensable for ceremonial purposes. "During the processional the choir will often start to sing while hidden behind the screen, producing an ethereal sound," says Yantis. "As they emerge from behind the screen, they also emerge acoustically."

At night, light from the new rose window acts as a beacon on a hill above Seattle. During the day. the roundel is highly visible from the city below, its apparent size increased by its installation within a large limestone circle. This prominent western elevation is the first of the "temporarily" exposed concrete exterior walls to be clad in pale gray Indiana limestone. Eventually all of the corroded sanctuary windows will be rebuilt and reglazed with a subtle frit pattern and tint to minimize glare, as were the two arched windows on either side of the rose window. Olson Sundberg is also designing new liturgical furnishings including an altar platform, a lectern, and an ambo. "I now know how the medieval cathedrals builders must have felt," says Olson, describing the work on St. Mark's, which stretches before him into the next century. ■

**Stone:** *Indiana limestone*
**Aluminum windows:** *Custom Window*
**Low-e glass:** *Northwest Industries*
**Fused clear glass:** *Douglas Hansen and Associates*

For 85 years, children with dreams of performing have attended the renowned Perry-Mansfield Performing Arts School and Camp. Now the oldest, continually-operated dance and theatre camp in the country, its distinguished alumni include; Doris Humphrey, Merce Cunningham, Agnes de Mille and Dustin Hoffman.

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# Understanding Accessibility Laws

## WHILE THE COURTS ARE CONSIDERING THE LIABILITY OF ARCHITECTS FOR ADA COMPLIANCE, THE FEDERAL GOVERNMENT IS REVIEWING AND REVISING DESIGN GUIDELINES.

**by Nancy Solomon, AIA**

Eight years have passed since Congress enacted the Americans with Disabilities Act (ADA) on July 26, 1990. While awareness of the needs of the disabled has certainly increased, and more buildings are more accessible to more people, much about the law is still in flux—from whether architects are directly liable if their buildings don't meet ADA requirements to the format and content of the law's design criteria. To minimize the risk associated with an ADA violation, architects would be wise to remain abreast of ongoing legislative developments and take advantage of the available tools and resources.

The ADA is a broad, sweeping civil rights law that prohibits discrimination on the basis of disabilities. Title I of the legislation addresses employment practices; Title II covers programs, services, and activities of state and local governments; Title III considers public accommodations and commercial facilities; and Title IV requires relay operators for telephone systems.

Recognizing the tremendous expense in removing all existing barriers, the law allows for different thresholds of accessibility. While new construction projects must be fully accessible, for example, only a percentage of construction funds must be earmarked for accessibility improvements for alterations or renovations. Finances permitting, owners of existing places of public accommodations must make readily achievable upgrades on a continuous basis. In addition, although buildings housing public programs administered by state and local governments must be accessible, not every existing space inside them need be.

Several agencies have jurisdiction over parts of the ADA. The Equal Employment Opportunity Commission handles regulations, technical assistance, and enforcement of Title I. The Department of Justice does the same for Titles II and III, and can also certify that a state or local accessibility code is equivalent to the ADA's requirements for new construction and alterations. The Department of Transportation handles regulations, technical assistance, and enforcement of transportation requirements under Titles II and III. The Federal Communications Commission oversees Title IV. And the U.S. Architectural and Transportation Barriers Compliance Board, an independent federal agency often referred to as the Access Board, develops the technical design guidelines and offers technical assistance on architectural, transportation, and communications issues.

The ADA is one of several laws designed to help the disabled community. The Architectural Barriers Act of 1968 applies to facilities designed, constructed, altered, and leased with certain federal funds. The Rehabilitation Act of 1973 requires programs that receive federal financial assistance to be accessible. And the Fair Housing Amendments Act of 1988 targets multifamily dwellings.

*Nancy Solomon, AIA, is a freelance writer located in Beltsville, Maryland, and frequently contributes articles on technology to ARCHITECTURAL RECORD.*

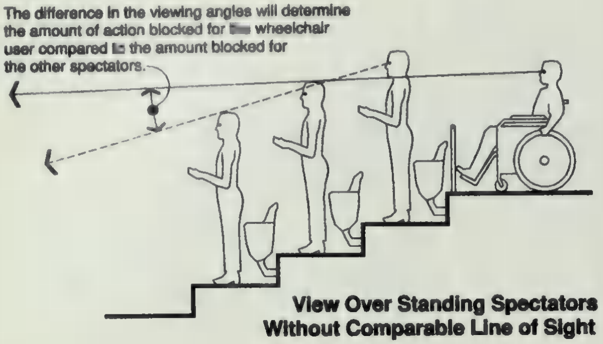
**The Raynes Rail is a wayfinding system developed for the visually impaired by Coco Raynes Associates. It provides information using Braille and audio messages.**

These laws have generated several accessibility guidelines. The Uniform Federal Accessibility Standards (UFAS) are issued by the General Service Administration, the U.S. Postal Service, the Department of Defense, and the Department of Housing and Urban Development for the Architectural Barriers Act. UFAS is based on the Minimum Guidelines and Requirements for Accessible Design, which are developed by the Access Board. UFAS is also the minimum standard for the Rehabilitation Act. Within ADA, private and commercial entities must follow the Justice Department's Standards for Accessible Design based on the Access Board's Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG) or a certified equivalent. State and local governments can follow either ADAAG or UFAS. For the Fair Housing Act, architects can heed the Fair Housing Act Accessibility Guidelines, issued by HUD, or CABO/ANSI A117.1 1986. In the meantime, most building codes have historically cited CABO/ANSI A117.1 as a reference on accessibility. Not surprisingly, a large part of the confusion among architects is the plethora of regulations and guidelines.

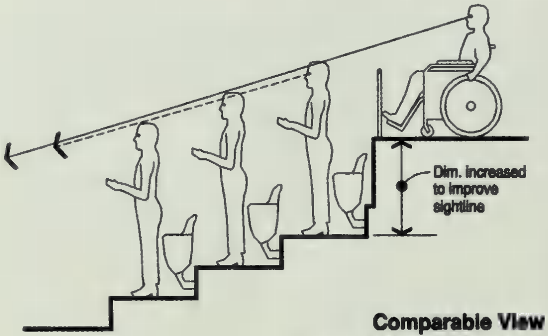
**Continuing Education** *Use the following learning objectives to focus your study while reading this month's ARCHITECTURAL RECORD/AIA Continuing Education article. To receive credit, turn to page 136 and follow the instructions.*

**Learning Objectives** *After reading this article, you should be able to:*

1. *Describe the scope of the Americans with Disabilities Act.*
2. *List the agencies that have jurisdiction over ADA compliance.*
3. *Contrast the AIA's position on the legal liability of architects in regard to ADA to the Department of Justice's position.*
4. *Describe the current method of merging different accessibility guidelines into one.*


The difference in the viewing angles will determine the amount of action blocked for the wheelchair user compared to the amount blocked for the other spectators.

**View Over Standing Spectators Without Comparable Line of Sight**



**Comparable View Over Standing Spectators**

Evan Terry Associates, accessibility consultants, proposed this solution to sight line problems in stadiums.

### Legal action

Since the law was enacted, lawsuits filed by individuals, groups representing the disabled, and the Justice Department for alleged ADA violations have tested the intent and language of the law in courts throughout the country. In some cases the critical question is who is liable for the infraction. In others, interpretations of specific content or requirements of the law are being argued.

From the architect's perspective, one of the most closely followed series of suits has been that filed against Ellerbe Becket Architects and Engineers, headquartered in Minneapolis. In June 1996, in a federal district court in Washington, D.C., the Paralyzed Veterans of America filed a suit against the firm and the owners and operators of the city's MCI Center. The veteran's group protested that the new arena failed to provide the disabled with a line of sight to the playing field comparable to that provided for able-bodied spectators. Specifically, the plaintiffs complained that people in wheelchairs could not see over the heads of people below who stood during particularly exciting parts of the game.

The Justice Department filed another suit in October 1996 in the U.S. Federal District Court in Minneapolis. Like the Paralyzed Veterans, the Justice Department argued that the firm failed to provide comparable lines of sight in six stadiums across the country. In the fall of 1996 two disabled persons filed suit against the owners of the Florida Panthers Arena and architect Ellerbe Becket, alleging that

## RESOURCES TO HELP WITH THE RULES

Given the complexity of the law and the seriousness of a violation, experts on all sides stress the importance of education. "This is not a statute that our members are purposely violating," says Stuart Binstock, former vice president of federal affairs at the AIA. "It is a complicated area, and many times, if violations have occurred, they come out of ignorance rather than purposeful avoidance of the law."

"First and foremost, architects should read the regulations—all of them," says Marsha Mazz of the Access Board. "The biggest mistakes I have seen are made by architects who want to use the ADA Accessibility Guidelines all by themselves. The ADAAG are just part of a larger body of regulations. The Department of Justice regulations include lots of information in addition to standards." Mazz also warns architects to make sure they have the right regulations for the client and the project.

In addition, code consultant Steven Winkel reminds architects that they must think about accessibility at the beginning of a project—during site planning and schematic design, when it is still relatively easy to make any necessary adjustments.

And Donald R. Hanks, an architect with BFE Architecture in Raleigh, North Carolina, adds, "When the project gets too big or complex, nothing can substitute for a consultant who specializes in accessibility. Architects are missing a lot of the detail since they are not working with the codes every day. You have to totally immerse yourself in them. You have to know the intent and be able to interpret the laws. And you also have to know the whole spectrum of users and what their different needs are."

Following are two of the most useful resources available for architects on the subject of accessibility guidelines.

**U.S. Department of Justice, Civil Rights Division, Disability Rights Section**

*ADA information line: 800/514-0301; 800-514-0383 (TDD)*
*www.usdoj.gov/crt/ada/adahom1.htm*

Department of Justice regulations, general information, and technical assistance can be obtained by phone or fax. Regulations, technical assistance materials, enforcement activities, status of building code certification, and information on proposed changes in requirements are also available.

**U.S. Architectural and Transportation Barriers Compliance Board**

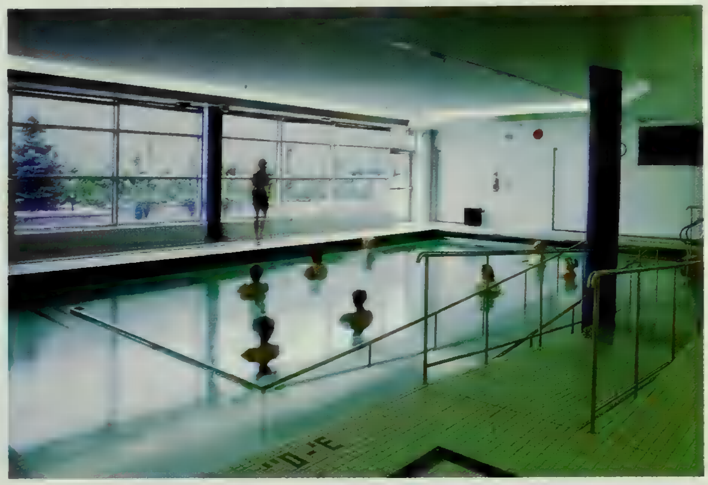
*ADA technical assistance line: 800/872-2253; 800/993-2822 (TTY); www.access-board.gov*

The ATBCB (the Access Board) has several architects and accessibility specialists on staff, each with an expertise relevant to different areas of rulemaking—with respect to ADAAG, the Access Board is the final authority. The Access Board will custom develop and deliver a training session for an office or a chapter workshop without a fee (they ask only that their travel and accommodations costs be reimbursed). Most training sessions can be accomplished for less than $500 and range from a half-day to three days. More than 6,000 slides are available as visual aids, as well as handouts that include recent rulemakings, ADAAG, technical assistance bulletins, and other materials to update attendees' files. Programs can focus on a specific project, a new guideline, or can clarify issues raised by the audience.

Visit the board's Web site for more information on its activities—there are eight rulemakings under way that will be of interest to many readers. Most of these rules will add new special-application sections to ADAAG over the next few years.

The AIA has an on-line forum at www.e-architect.com/gov/ada.asp to collect member comments on the Recommendations for New ADAAG. A task force will use these opinions to create an AIA consensus report, which will be sent to the board after the proposed rule is issued.

Providing accessible facilities for customers is simply good for business. A wheelchair-accessible lavatory at the New York New York Hotel and Casino in Las Vegas (left) and a ramp-accessible exercise pool at the Wellness Center in Manitoba, Canada, allow more people to use these facilities.



the new stadium in Broward County was inaccessible in various respects, including line of sight.

These cases against Ellerbe Becket have been resolved. The architects were dismissed prior to the trial phase of the D.C. case in July 1996 by the judge, who ruled that architects were not directly liable under the ADA. In February 1997, the U.S. District Court of Southern District of Florida determined that architects were directly liable and kept Ellerbe Becket in the Panthers Arena case; however, the case was dropped by the complainants. In October 1997, the U.S. District Court in Minnesota denied a motion by Ellerbe Becket to dismiss the case against the firm. Ellerbe Becket and the Justice Department subsequently agreed to a consent order in May of this year. It stipulates that in the future the firm will use guidelines that the government says will ensure that spectators in wheelchairs can see the action in stadiums, even when fans are standing in front.

The AIA, which has filed a friend-of-the-court brief in the Washington and Minneapolis cases, argues that the ADA did not intend for architects to be sued directly under the act. Architects are responsible to the owners for ADA compliance through a contract for professional services, and must perform to a professional standard of care, according to the AIA's Statement on Universal Accessibility and ADA in its Americans with Disabilities Act and Fair Housing Act Resource Supplement.

According to Stuart Binstock, former vice president of federal affairs at the AIA, the difference between suing an architect under a contractual relationship and suing directly under ADA is in the standard of liability: Within a contractual relationship, architects may be sued under tort law for violating their reasonable standard of care. Under ADA, the standard is strict liability. Under a contractual obligation, therefore, an architect can argue that he or she did what could reasonably be expected in that particular situation. No such excuse is acceptable under the civil rights legislation—the architect would simply be liable if a violation is found, no matter what the extenuating circumstances.

Despite the AIA's position, some accessibility experts believe that eventually the Department of Justice's position is likely to prevail. "If I were a conservative architect, I would be nervous," says Kathy Gips, director of training at Adaptive Environments in Boston.

**Certification process**

Unlike standards referenced by a building code, no official is authorized to review an architect's decisions about ADA Accessibility Guidelines during the design process. "Enforcement is done after the fact," explains code consultant Steven R. Winkel, FAIA, an architect and civil engineer in Berkeley, California. "This is unfortunate, because when it comes to the built environment, change is always easier on paper than in the field," he says. To redress this, the ADA requires the Justice Department to review any building codes submitted by state and local authorities to determine if they meet the same or comparable accessibility standards.

Unfortunately, to date only four state building codes have been certified, those in Washington, Texas, Maine, and Florida. New Mexico, Minnesota, New Jersey, Maryland, California, the Village of Oak Park, Illinois, and the County of Hawaii, Hawaii, are awaiting code review. "We think that is too slow," says Binstock. According to Binstock, the Justice Department is trying to hire more staff to speed up its ability to certify state codes. "The certification of codes is crucial," continues Binstock, "because once a code is certified, a project that complies with the certified state or local code complies with ADA". This provides some predictability for the private sector—something that presently does not exist in locations where a code has not been certified by the Justice Department.

**NO CODE OFFICIAL IS AUTHORIZED TO REVIEW AN ARCHITECT'S DECISIONS CONCERNING ADAAG DURING DESIGN.**

**ADA Accessibility Guidelines revisions**

On another front, the Access Board is supplementing and refining its original guidelines. Last January the board issued what it calls final rules regarding children's facilities, courts, and jails.

The rules for children's use permit a designer to specify a child-sized accessible element, such as a toilet room, rather than its adult-sized equivalent, in rooms designated for children, such as a nursery school room. Before the advent of these guidelines, design professionals were not required to provide child-sized facilities and often did not, even though this would seem to be a matter of common sense. "The ruling does not require additional child-sized elements in facilities not primarily designed for children," explains Marsha K. Mazz, technical assistance coordinator at the Access Board, "even if children may sometimes be present." The children's rule will apply to Titles II and III when adopted by the Department of Justice.

The final rules for judicial and detention facilities give scope and technical design guidance to these two building types. Until now, ADA Accessibility Guidelines had not stipulated design guidelines targeted to the unique needs of these facilities. Among other requirements, the judicial section states that jury boxes and witness stands must be accessible, and the detention section reduces the percentage of accessible jail cells from five to two. Title II entities—state and local agencies—may elect either UFAS or ADA Accessibility Guidelines 1–10 as the design standard for new construction or alterations.

Like all guidelines published by the Access Board for ADA, these are not enforceable until the Justice Department issues them as standards. The department is expected to write appropriate preambles, submit the proposed requirements for public comment, and issue their own final rules later this year. Of even greater interest to architects, however, is the Access Board's ongoing review of the ADA's guidelines as a whole. In 1994 the Access Board convened a federal advisory committee to reconsider the ADA Accessibility Guidelines in their entirety.

Although periodic review of regulations is standard for a federal agency, such a committee is not. "We convened it because we saw a need to harmonize with model codes," says Mazz. "We thought there were a lot of folks out there who had good information and we wanted to make sure that there were no unnecessary conflicts. We were not given time to do that for the first version." The committee, which consisted of 22 representatives from various building, construction, code, and disability organizations, issued the Final Report: Recommendations for New ADA Accessibility Guidelines on September 30, 1996, after more than two years of work.

At the time the committee was convened, the ANSI A117 committee was gearing up for its routine, five-year revision of its own CABO/ANSI A117.1 standard. Many in the field saw this as the golden opportunity to bring the various accessibility codes and standards in line with one another. "There are a lot of pieces to accessibility," explains David A. Harris, FAIA, chair of the National Institute of Building Sciences in Washington, D.C., and president of the advisory committee. "It should be a goal to get all of these things coordinated so architects, building owners, and others don't have to use different criteria." One of the biggest complaints about ADAAG from the perspective of design and construction professionals is that it isn't CABO/ANSI A117.1, so architects typically have to adhere to both to satisfy ADA and their local code.

Many members of the ADA Accessibility Guidelines committee also sit on the CABO/ANSI A117 committee, and a special subcommittee was formed to coordinate the two. Harris reports that compromises were

## ADA REFERENCES AND DESIGN AIDS

A number of computer-based education and design tools are available to help designers wend their way through the plethora of ADA design rules and regulations and to suggest design solutions that are ADA-compliant. The software vendors continually update their products to reflect the latest changes in these rules.

**ADA Design Assistant**

In conjunction with Softdesk's Auto-Architect 8.0 and AutoCAD R13/14 on Windows 95 or NT, this access-compliance software helps architects with some of the most problematic details—curbs, ramps, doors, and toilet rooms—as the project is being drawn.

*Evan Terry Associates*
*One Perimeter Park South, 200S*
*Birmingham, AL 35243*
*205/972-9101*
*205/972-9110 fax*

**ADA Self-Study**

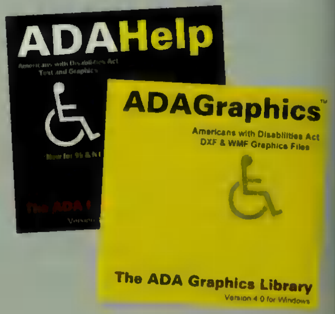
This interactive software package provides an overview of the ADA, including terminology, practice tips, and references. Runs under Windows 3.1x, 95 or NT.

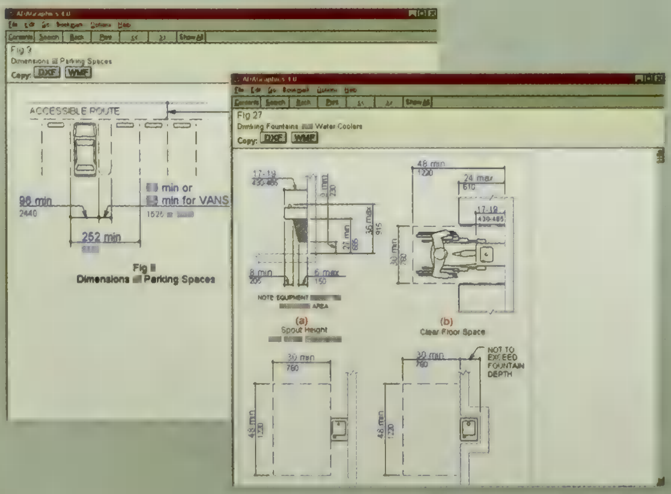
*AIA Learning Products*
*202/626-7465*

**ADAHelp 4.0**
**ADAGraphics 4.0**

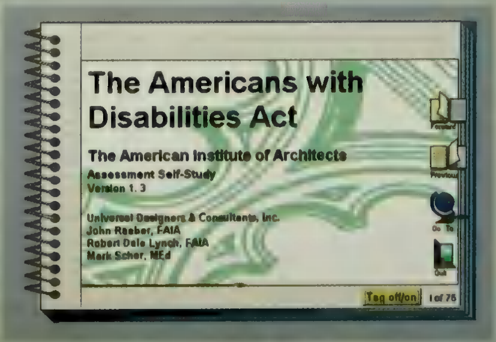
ADAHelp is a Windows program that helps architects sift through the ADA regulations. Updates will be made available as new regulations are adopted. ADAGraphics allows the user to view ADAAG graphics files and copy them into DOS or Windows CAD programs. Both of these products will run under Windows 3.1x, 95 or NT.

*Kelley Computer Software*
*1701 Broadway, Suite 348*
*Vancouver, WA 98663*
*503/771-7242*
*adahelp@aol.com*


ADAHelp
Americans with Disabilities Act Text and Graphics
ADAGraphics™
Americans with Disabilities Act DXF & WMF Graphics Files
The ADA Graphics Library
Version 4.0 for Windows



**ADAHelp and ADAGraphics programs (above; detail of ADAGraphics left) help designers sift through ADA regulations and add ADAAG graphics to drawings. The AIA offers a self-study course in ADA terminology, practice tips, and a reference guide (below).**



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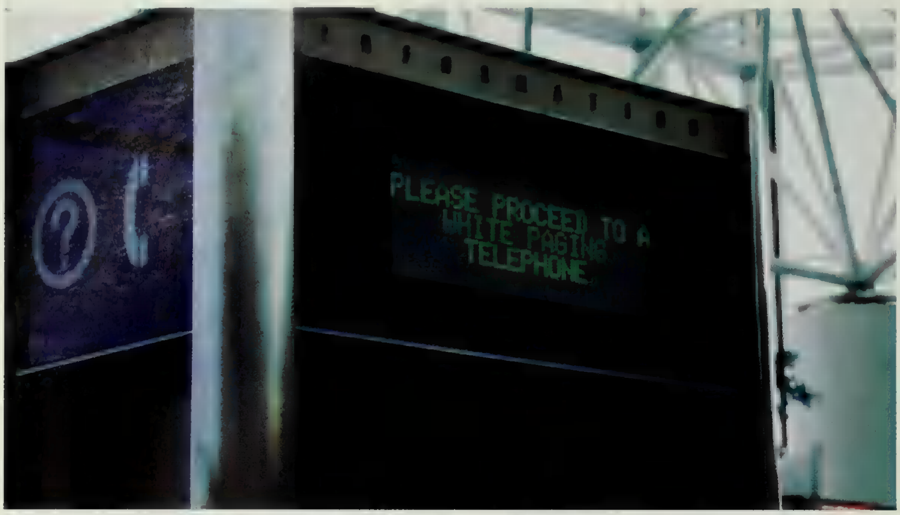

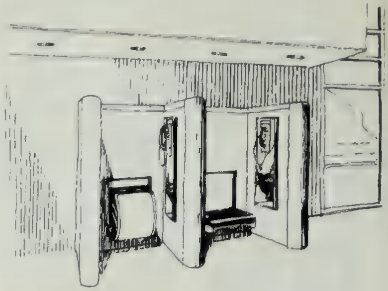

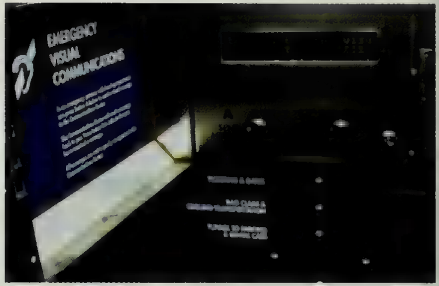

**A visual paging system (above), an emergency two-way communications system (right), and accessible telephone booths (drawing) were designed by Pamela Pflueger Associates for use at the Portland, Oregon, International Airport.**

made on both sides so that the documents could be as close as possible. Both were reformatted during this process. Instead of being arranged in sections according to how a disabled person experiences a space, they are organized in chapters according to building systems. The format is more like a building code, explains John P.S. Salmen, AIA, president of Universal Designers & Consultants in Takoma Park, Maryland, and AIA representative to the committee. He predicts that the new organization will give more flexibility and be easier to apply to a wider range of situations.

Unlike ANSI, the original ADA Accessibility Guidelines include both the scope of work—in which the required number of accessible toilets, for example, is specified—and technical criteria, such as the dimensions of those toilets. Both types of information are mixed together in the ADA document, forcing architects to sift through the technical material to determine how many of a particular fixture are needed. The proposed ADA Accessibility Guidelines document separates the two: all scoping information is contained in one chapter, while the technical criteria appear in the appropriate systems chapters. In addition to making it easier for an architect to determine what is required, explains Salmen, this change makes it easier to compare ANSI and the ADA Accessibility Guidelines.

Marvin J. Cantor, FAIA, a building codes and standards consultant in Fairfax, Virginia, estimates that the committee achieved about 90 percent harmony between the two draft documents. "Now we have ADA Accessibility Guidelines that look like ANSI with an additional chapter," says Salmen. "It's wonderful for the architect because it lays the groundwork for the federal government to adopt consensus standards from the private sector." The committee made other changes as well. It cleaned up the language of the guidelines, for example, using enforcement language consistent with building code terminology. "We have become very careful in the use of mandatory language," says Mazz. To avoid legal confusion, it also converted criteria contained in pictures to text. Drawings that once held legal clout are now merely helpful illustrations in an accompanying commentary. Technical criteria were clarified and in some cases enhanced, such as those for visual and tactile signage.

The Access Board is now reviewing the September 1996 report, inserting its new provisions regarding children's, judicial, and detention facilities, and coordinating the draft with revisions of other guidelines under its authority, such as the Minimum Guidelines and Requirements for Accessible Design. "In the end, we hope to provide a very tightly correlated set of guidelines," says Mazz.

The board hopes to publish the Notice of Proposed Rulemaking for Revisions to the ADA Accessibility Guidelines for public review in the early months of 1999, after which the board will issue its final rule. The new ADA guidelines, however, will not become law until the Justice Department reviews them, makes additional changes if deemed necessary, and incorporates them into its own standards, which are appended to its regulations. This several-tiered procedure concerns some in the industry. "It was an enormous process—the negotiating and balancing to get everyone to agree," explains Salmen. "ANSI has now adopted the revisions, but the Access Board has been tinkering with them for a year and a half. And then the Justice Department will decide what they will do. We pray that it will look the same but are afraid that it won't."

Salmen encourages architects to respond during the public comment period, requesting that the new ADA Accessibility Guidelines resemble the new CABO/ANSI A117.1. "We have the opportunity for the first, and maybe only, time to bring the two together," Salmen says. "There will be many more opportunities to ratchet up the degree of accessibility, but this is the only opportunity to establish one standard, thereby simplifying the entire process." Salmen hopes that if the ADA Accessibility Guidelines and ANSI can be closely coordinated now, one day ADA Accessibility Guidelines can simply adopt the ANSI standard and add its own chapter. In response to such concerns, Mazz is reassuring: "The committee report has had as few changes as is necessary to date. The board is proceeding very carefully with a great deal of respect for the report and the work of the advisory committee," she says.

The Access Board welcomes architects' comments on the recommendations for the new ADA Accessibility Guidelines. The report can be read on the Access Board's Web site or obtained by calling the board's toll-free number (see resources sidebar). Mazz suggests architects report what they don't like, but also what they do like. "I can guarantee that for everything someone likes, there is someone who won't like it," adds Mazz. "But if someone sees that a problem has been taken care of, they should let us know." ■

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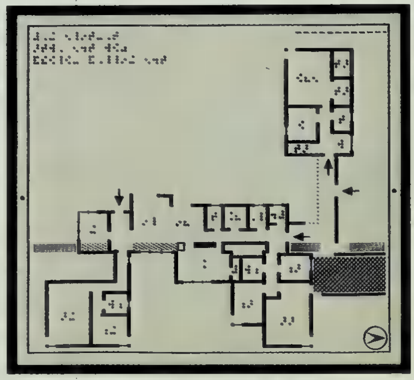
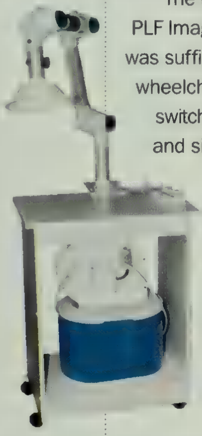
# NEW PRODUCTS

## UNIVERSALLY DESIGNED PRODUCTS FOR THE MILLAY ARTS COLONY

**As mentioned in the story on the Millay Colony for the Arts (page 78), executive director Ann-Ellen Lesser was determined to see that the colony's new building be a retreat where everyone, especially artists with disabling conditions, can enjoy the creative process. This page describes how various manufacturers developed new products or simply donated existing ones that helped Lesser meet her goal. Continuing our look at ADA-compliant products this month, page two highlights other commercial and residential building products that meet the needs of architects designing for the disabled. —*Elana H. Frankel, Products Editor***

**Ann-Ellen Lesser and designer/artist Michael Singer worked with product manufacturers like Nederman, Whirlpool, and Interface as well as artists-in-residence to create a collection of universally designed products for Millay.**



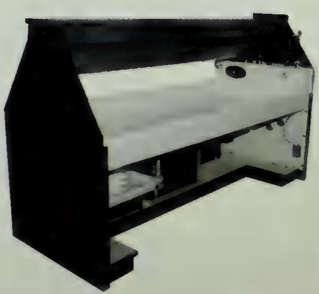


When executive director Ann-Ellen Lesser enlisted the help of designer Michael Singer and a planning committee of artists to work on a new building for the Millay Colony for the Arts, she didn't realize that they would encounter the first of their many challenges so quickly. One of the members of the planning committee was visually impaired, and they had to devise a way for him to decipher the architectural plans for the project. After reading an article about an organization called Art Education for the Blind and its use of tactile drawings, Lesser contacted Teresa Kardoulias of InTouch Graphics and Accessories Plus, who designed a customized tactile plan as well as a large-print map (above right).

Another issue faced during the planning process is a concern for many artists, disabled or not: adequate exhaust systems. Nederman, a commercial exhaust system manufacturer, worked with Lesser and a group of colony artists to create Studio Assistant, a compact, mobile extraction unit that removes toxic fumes and dust (above). The system worked so well for Millay—disabled artists can easily wheel the system around—that Nederman decided to market the product nationwide.

The initial darkroom design, by PLF Imaging, was accessible: there was sufficient floor space for a wheelchair, and lower-height light switches, equipment controls, and sinks. But Lesser pushed for universal design: “We weren't satisfied with just accessibility. We wanted universality.” PLF Imaging called on photo-equipment manufacturers to create wheelchair-accessible light-tight revolving doors with ramps and a handicapped-accessible film-processing station (below). “Product manufacturers were very creative in finding solutions to fit our goal,” says Lesser.

For the kitchen, Whirlpool, a company that has given much thought to appliances for a graying nation, worked with the Millay Colony to provide design insights as well as products (above left).



Among products donated to the colony were recycled carpet from Interface's Compositions collection, which can be traversed easily in a wheelchair; a collection of universal tableware by Mary Bulger of Marusya, Inc.; and communications equipment from Ameriphone.

“What we learned,” reports Lesser, “is that once your goal is universality, you test everything against it. And even though we couldn't solve everything, we were able to accomplish a great deal.”

Accessories Plus, Chicago
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Interface, La Grange, Ga.
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InTouch Graphics, New York City
212/677-4575 **CIRCLE 203**
Marusya, Albany, N.Y.
518/274-1745 **CIRCLE 204**
Nederman, Westland, Mich.
313/729-3344 **CIRCLE 205**
PLF Imaging, Central Islip, N.Y.
516/582-6150 **CIRCLE 206**
Whirlpool, Benton Harbor, Mich.
616/923-7200 **CIRCLE 207**

*For more information, circle item numbers on Reader Service Card*

## BUILDING PRODUCTS THAT MEET ADA NEEDS

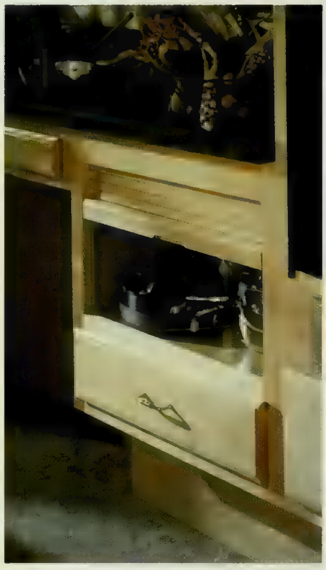
From AutoCAD software enhancements to universally designed cabinetry for the kitchen, the innovative products that are highlighted on this page will help architects, builders, and developers design residential and commercial buildings that satisfy the needs of the millions of people who are challenged by physical limitations.

### ▲ AutoCAD assistance

Evan Terry Associates' ADA Design Assistant software is an add-on for SoftDesk Auto-Architect 8.0 that helps users design ADA-compliant buildings. Drawings, like the one shown above for a single-user bathroom, can be dragged and dropped into AutoCAD or Auto-Architect. The drawings include dimensions and turning spaces, as well as fixture and door clearances. For use with AutoCAD R14 on Windows 95 and Auto-Architect 8.0. 205/972-9101. Evan Terry Associates, Birmingham, Ala. **CIRCLE 208**

### ▼ Power to the people

Wiremold's Perimeter raceway system provides access to power, voice, and data at any height. A running raceway approximately three feet high makes access easier for those with disabilities. 800/621-0049. Wiremold Company, West Hartford, Conn. **CIRCLE 209**



### ▲ Universal design elements

Kraftmaid's Passport kitchen cabinet series, available in 10 door styles, three wood species, and various finishes, has low counters, work centers, wall ovens, and microwaves, which can be used while seated. A nine-inch toe kick allows wheelchair users to move around the kitchen freely. 440/632-5333. Kraftmaid, Middlefield, Ohio. **CIRCLE 210**

### ▼ Specialized seating

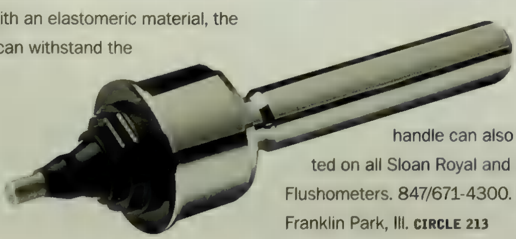
Invacare's extensive line of tailored power and manual chairs includes the Action Super Pro-T wheelchair, shown here, which has a completely customized frame and is available in a variety of colors. 800/333-6900. Invacare, Elyria, Ohio. **CIRCLE 211**

### ◄ For kitchen and bath

Elkay offers an extensive line of ADA-compliant residential sinks and faucets, including single- and double-bowl sinks as well as single-lever and single- and two-handle faucets. Elkay also offers single-lever lavatory faucets. Shown here is model GECR-3321, a double-bowl kitchen sink from the Celebrity line. Made of 20-gauge stainless steel, the sink features a bowl depth of 5⅛ inches, making it accessible for people in wheelchairs. 630/574-8484. Elkay, Oak Brook, Ill. **CIRCLE 212**

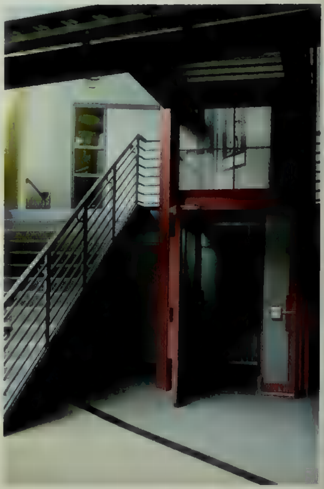
### ▼ Retrofitting toilets

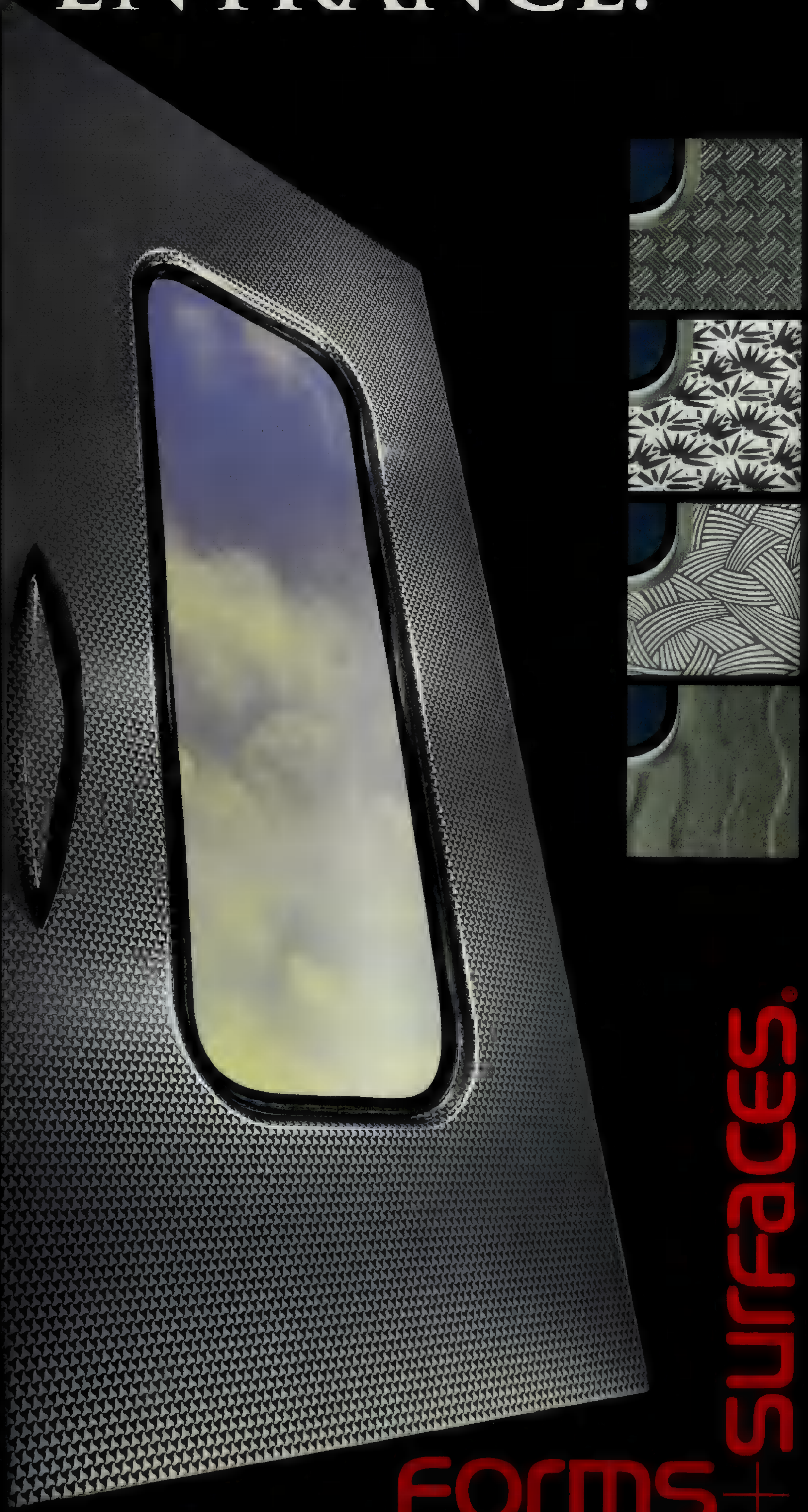
The new, ADA-compliant A.D.A. Flushometer handle from Sloan is now triple-sealed and has an increased length. Made with an elastomeric material, the handle can withstand the chemically treated water of most municipal water systems. A sealing lobe with sharp edges acts like a scraper to dislodge foreign material. The handle can also be retrofitted on all Sloan Royal and Regal Flushometers. 847/671-4300. Sloan, Franklin Park, Ill. **CIRCLE 213**



### ► A custom lift between levels

The S-model vertical platform lift manufactured and distributed by Access Industries can be customized to blend with surrounding interiors and/or exteriors. A selection of hoistway door and gate options is available, as is a variety of control panels (platform-, post-, and flush-mounted pushbuttons) and finish colors (taupe, sable brown, pearl gray, and ivory white). Lift heights up to 171 inches can provide easy access between two or three landings. Three platform sizes are available: 36 by 38 inches, 36 by 56 inches, and 36 by 60 inches. 800/925-3100. Access Industries, Grandview, Mo. **CIRCLE 214**





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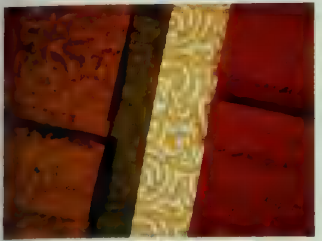


### ▲ Cotton and chenille

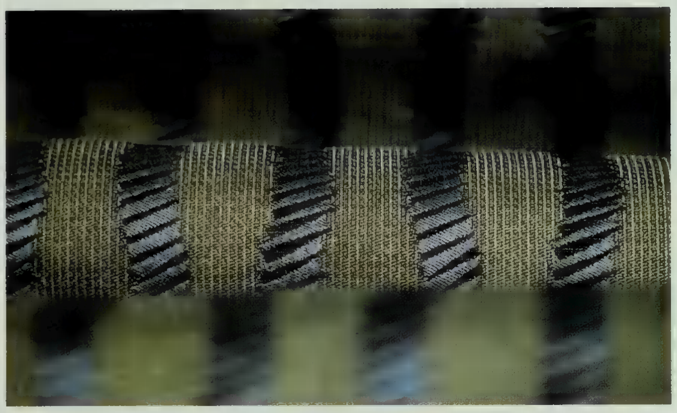
Grahampton chenille, a viscose/cotton chenille blend from Brunschwig & Fils, is a jacquard design with Celtic origins. A stylized letter B is the focal point of its serpentine figure. Available in two neutrals and a pair of darker solids. 212/838-7878. Brunschwig & Fils, New York City. **CIRCLE 215**

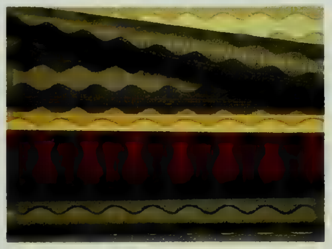
### ▲ Textile resource

The Bridging collection of new patterns from Shashi Caan/Nizina is based on design elements derived from bridges: Colu is named for a bridge in Colusa, California; Nizina for an Alaskan bridge; and Arvada for a bridge in Wyoming. 336/885-2900. Nizina, High Point, N.C. **CIRCLE 218**

### ▼ Zip-a-dee-doo-dah

Zip City, one of several new patterns from Maharam, features an undulating sawtooth band against a metallic background. Also available are Elegy, Credence, and Tenet, three coordinating upholstery fabrics; and Somerset, four vinyl wallcoverings inspired by medieval designs. 800/600-3636. Maharam, New York City. **CIRCLE 216**





### ▲ Classical motifs

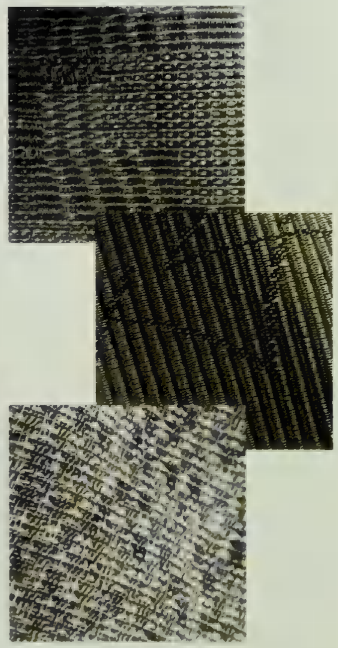
The Civilization collection, by Dorothy Cosonas, director of design for Unika Vaev, a division of ICF Group, consists of four fabrics, including Odyssea, an undulating vertical-striped pattern, shown here in a variety of colors. 800/237-1625. ICF Group, Valley Cottage, N.J. **CIRCLE 219**

### ▼ Asian inspiration

Donghia's Night Garden collection features four designs: Protea, Daphne, Moonray, and, shown here, Chaya, named for the Japanese tea house. The tapestry is a cotton/wool/polyester/nylon combination with leaves and stems strewn across an earth-toned background. Available in five colors. 212/925-2777. Donghia, New York City. **CIRCLE 220**

### ▼ Corporate puns

Textile designer Michael Laessle has created three new additions to the Resumé Collection for Business by Pallas Panels, a new division of Pallas. Game Plan has a checkerboard motif; Paper Shuffle is reminiscent of a ticker-tape parade; and Human Resources is a random-looking grid of rectangles and squares. The fabrics are 100 percent fire-retardant polyester, measure 66 inches wide, and meet ACT standards. Laessle is donating all of his royalties from this collection to the Michael D. Laessle Foundation for AIDS Care, a newly established organization whose mission is to improve the quality of life of people with AIDS. 800/4-PALLAS. Pallas, Green Bay, Wisc. **CIRCLE 217**

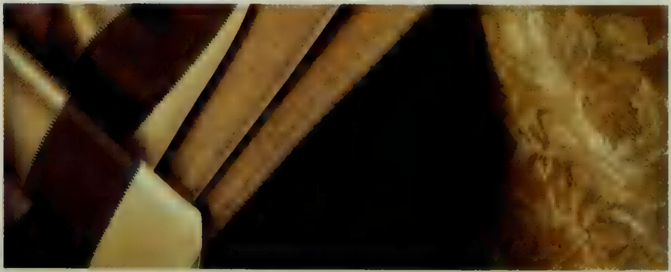


### ▲ Sophisticated design

The Spring 1998 collection of fabrics from Pollack and Associates, called Celebration, includes (from left to right) Square Knot, a small check that alternates satin boxes and knots of bouclé yarn; Monarch Mohair, with a subtle panné; Box Seat, a plaid of cotton, viscose, linen, and nylon that coordinates with Square Knot; and Knit Wit, a window fabric that combines a warp knit construction and a viscose raffia fiber. 212/627-7766. Pollack and Associates, New York City. **CIRCLE 221**

### ▼ Sit back and think of England

Inspired by the gracious style of the 18th-century English manor Stratfield Saye, an estate outside London, contract fabric designer Mary Jo Miller created the Stratfield collection for HBF, which includes (from left to right) Library, Drawing Room, Great Hall, and Print Room. 828/328-2064. HBF, Hickory, N.C. **CIRCLE 222**



*For more information, circle item numbers on Reader Service Card*

### ▼ Walks of life

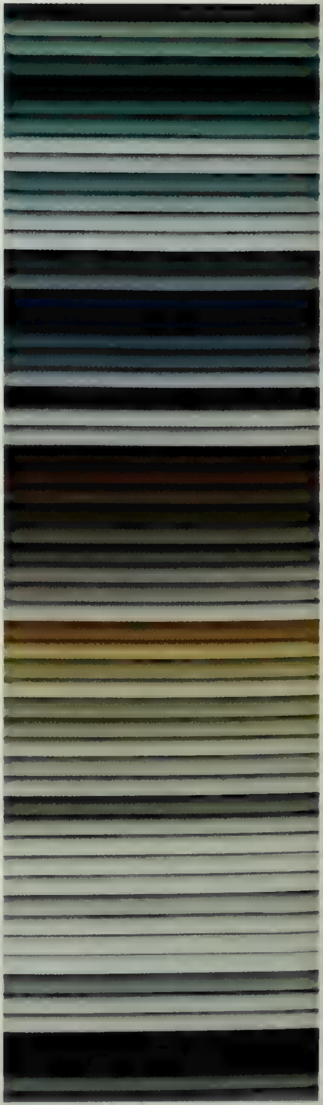
To commemorate Pergo's 20th anniversary, Perstop Flooring has introduced six new laminate floor designs, including the black-and-white checkerboard pattern shown here, a brown-and-beige checkerboard, Amsterdam oak, Newport green, gunstock oak, and travertine stone. All six designs feature matching wallbases and moldings. 800/33-PERGO. Perstop Flooring, Raleigh, N.C. **CIRCLE 223**

### ▲ Greenhouse effects

In restoring the New York Botanical Garden's Enid A. Haupt Conservatory, a 1902 greenhouse by Lord and Burnham, 52 coats of paint were scraped away and replaced with polyurethane coatings from Tnemec containing Desmodur polyisocyanates from Bayer. Since durability and low maintenance were top priorities, New York City architects Beyer Blinder Belle and engineers Ove Arup and Partners specified the zinc-rich polyurethane primer, an intermediate polyamide epoxy, and an acrylic polyurethane finish coat for the conservatory's exposed steel framing and cast-iron gutters, splice plates, and connectors. 816/483-3400. Tnemec, Kansas City, Mo. **CIRCLE 224** 412/777-2815. Bayer, Pittsburgh. **CIRCLE 225**

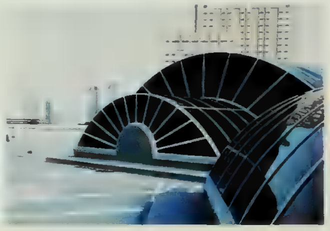
### ▼ Color coordinated

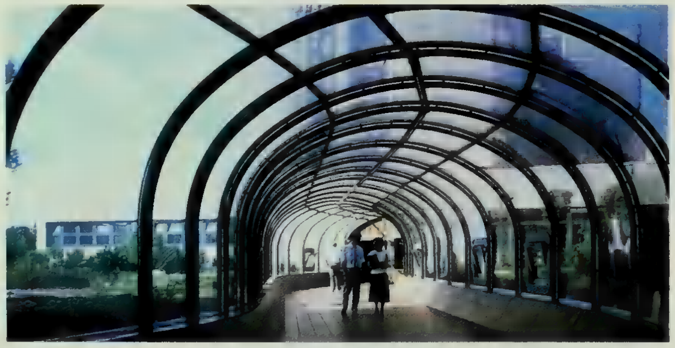
Armstrong has introduced 15 new colors to the Imperial Texture line of vinyl composition tile; five colors of slip-retardant tile floors; 15 new colors of vinyl sheet flooring; and 60 solid-color welding rods, shown here, which provide better seam matches. 800/292-6308. Armstrong, Lancaster, Pa. **CIRCLE 226**



### ► Acrylic sheet coatings

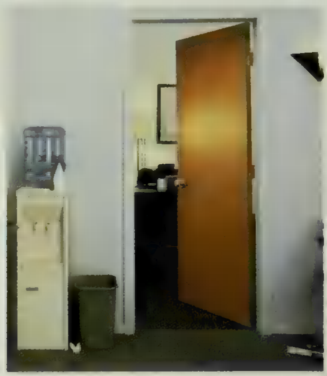
CYRO licensed 3M's 906 abrasion-resistant coating for its ACRYLITE AR acrylic product. The sheet is available with coating on one side or both; a coated ACRYLITE AR sheet has 40 times the mar resistance of uncoated. 800/631-5384. CYRO, Rockaway, N.J. **CIRCLE 227**

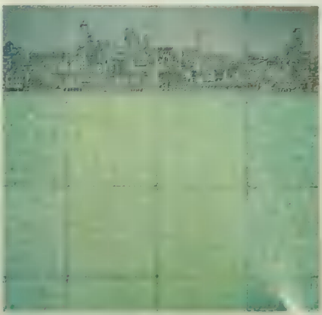




### ▼ Interior door design

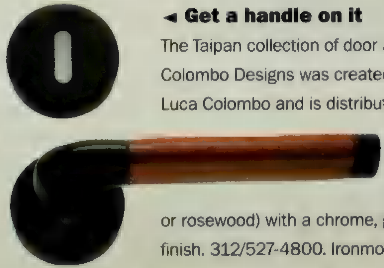
TruGrain flush door facings from Masonite are manufactured with high-density fiberboard made from wood. The two finishes are a light, warm natural tone and a rich medium hue called harvest. Prefinished trims are also available. 800/405-2233. Masonite, Chicago. **CIRCLE 228**





### ◄ Ch..ch..ch...changes

Ferro's Chameleon glaze changes the color of tiles when they are exposed to light. The glaze's formula works with the color spectra generated by different light conditions (morning, noon, or evening). A bathroom that is powder blue in the early morning hours will evolve into a deeper periwinkle by twilight. The glaze can be applied to field and trim tiles. 216/641-8580. Ferro, Cleveland. **CIRCLE 229**



### ◄ Get a handle on it

The Taipan collection of door and window handles from Italy's Colombo Designs was created by Milanese industrial designer Luca Colombo and is distributed in the United States through Ironmonger. Available in metal (chrome, mercury, or matte black) or wood (briar, pearwood, or rosewood) with a chrome, gold, or matte nickel, gold, or black finish. 312/527-4800. Ironmonger, Chicago. **CIRCLE 230**

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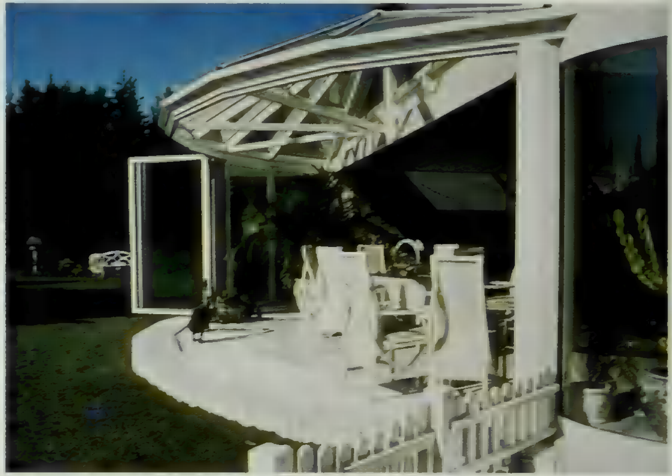
## PRODUCTBRIEFS

### ◄ Bicoastal appeal

Weather Shield Windows and Doors has redesigned and expanded its product line of ProShield vinyl-clad wooded windows to include a new corrosive-resistant hardware package—to help combat salt air, sea spray, blowing sand, and searing sun in coastal homes—and French and center-hinged styles of patio doors. 800/477-6808. Weather Shield, Medford, Wisc. **CIRCLE 231**



### ▲ Folding glass walls

System SL 45, a 10-panel aluminum-framed folding wall shown here with a 20-degree angle between panels, can be created in heights up to nine feet six inches and panel widths up to three feet seven inches. Powder-coated, anodized, and wet finishes are available. 800/873-5673. Nana Wall System, Mill Valley, Calif. **CIRCLE 232**

### ▼ The beauty of brick

The M Brick system from Pacific Brick Systems embeds brick in concrete using interlocking brick inlay templates (BITs). Each BIT holds a thin brick and snaps together with other BITs. Concrete is poured over the back of the bricks. After curing, the BITs are removed, revealing the brick veneer and coved mortar joints. 800/387-6945. Pacific Brick Systems, Portland, Oreg. **CIRCLE 233**

### ▲ Thin is in

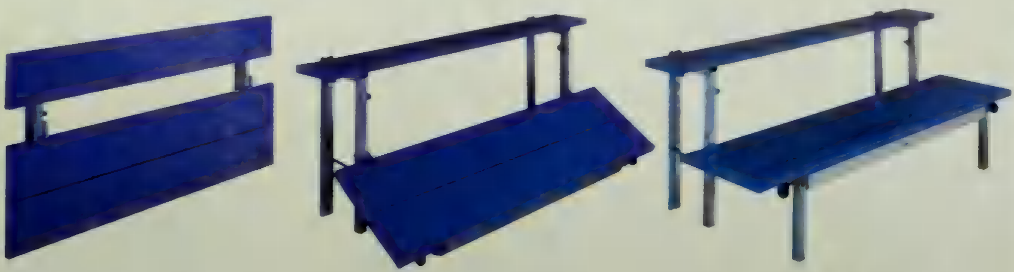
The future of home theater is with Philips Electronics' latest version of the popular Plasma Technology Flat TV system: a 4½-inch-thick monitor, a control/receiver box, and four sound channels and an integrated center speaker for Dolby Pro Logic surround-sound. The television is DTV-compatible and can accommodate a split or mosaic screen. It can also display images from laserdiscs and videocassettes. 770/821-2400. Philips, Atlanta. **CIRCLE 234**

### ▼ Outdoor acrylic technology

For years, Aristech has been producing acrylic-based sheets under a private label. At the AIA convention in May, the company launched its own exterior wall-cladding product. 800/354-9858. Aristech Acrylics, Florence, Ky. **CIRCLE 235**

### ▼ Hide it up; hide it down

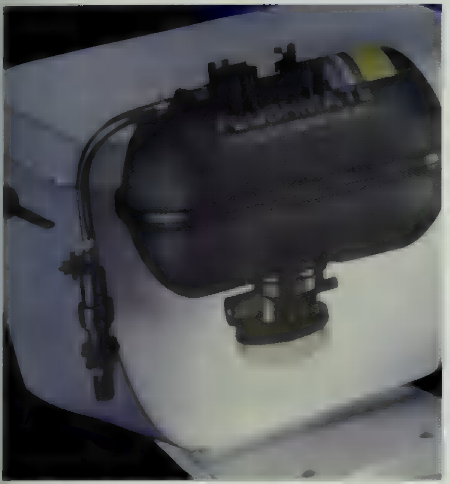
Created by Mike Peterson and Patrick O'Connor, the Hide-A-Bench from Athletic Seating Technologies (Astech) allows for a maximum of 14 seats in a two-row option (a single row is also available). The bench can also be used in handicapped seating areas mandated by the Americans with Disabilities Act. Optional accessories include hand- and end rails and color padded covers. 303/674-2595. Astech, Evergreen, Colo. **CIRCLE 236**



### ▲ Built-in drainage system

The architectural firm of Cox, Kliewer and Company recently used Parex Water Master EIFS as the exterior cladding for Linkhorn Bay, a waterfront condominium project in Virginia Beach, Virginia. Covered with 100 percent acrylic colored finishes, Water Master has a liquid membrane that protects the sheathing from moisture and an EPS insulation board with drainage channels. Evaluated by the ICBO and SBCCI. 800/537-2739. Parex, Redan, Ga. **CIRCLE 237**

# A Tale of Two Water Closet Technologies



### by Joseph M. Smaul, P.E.

It was while working as the head of plumbing engineering and overseeing the HVAC for hotels on the East Coast that I became involved with pressurized water closets. We just finished a 600-room facility and we were preparing to go to work on the next 400-room project, when a letter crossed my desk from the major fixture manufacturer for the new project. This fixture manufacturer — who was different from the one we used on the 600-room hotel — suggested that we do not use gravity-flushing closets in the hotel we were engineering. Instead, the manufacturer recommended his line of pressure-assist water closets for a variety of reasons.

The question immediately arose in my mind: why? If pressure-assist is the standard for hotels, why didn't the other manufacturer for the 600-room hotel recommend it?

I was assigned the task by the principals of my company to find out what this was all about, so I called the head of maintenance engineering at the 600-room hotel where we had specified and had 1.6 gravity-flush water closets installed. I asked him how these gravity units were working out.

I still recall how matter-of-fact he was when he calmly said, "I'm really glad you called. We get about 75 to 100 calls a week to unclog these toilets. It has become pretty routine now. I think ever since they limited the water usage to 1.6 gallons per flush, that's when the problems started. We leave plungers right in the rooms now, so we don't have to be carrying them down the halls in front of the guests. I guess there isn't much we can do about it!"

I was looking at the other manufacturer's letter that recommended pressure toilets on my new project as I listened to his comments. He continued, saying, "We are experiencing tremendous guest dissatisfaction over this clogging, double flushing, and poor performance. But say, I've heard of something that might be worth investigating as long as I have you on the phone. I think they call it pressure toilets. Can you find out if there's anything to this? I've called the fixture manufacturer, too, and they said they are looking into the situation for us. There might not be anything we can do except live with it."

I said I would see what I could do, and hung up the phone. I then called the original manufacturer we used at the 600-room hotel. It turned out that he was already well aware of the clogging problems at the hotel...that he was in the process of re-engineering his fixture, and that he would step up and resolve the situation for the maintenance engineer's and my own satisfaction.

I decided I needed more information before I made our final recommendation between gravity and pressure-assist, so I researched further by calling maintenance engineers around Las Vegas hotels. I found out that they were either installing pressure-assist, or replacing gravity with pressure-assist. One of the casinos actually took out ALL of their gravity toilets and replaced them with pressure-assist! Since they started using pressure, they were able to reduce their service factor on toilets to zero.

I asked around some more, and I heard from people who bought new homes that were disgusted with the 1.6 gravity because of flushing two or three times. Then I remembered that my own relative had a closet off the den with 1.6 gravity that even the kids were not allowed to use because of performance problems. They actually have to go upstairs to the second level toilets.

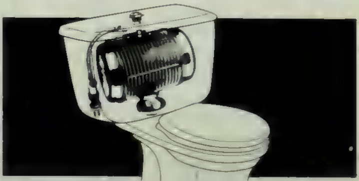
Well, all of this made our decision easy, and we recommended pressure-assist toilets.

But I also came upon something from my study that was truly amazing: it didn't matter which fixture manufacturer was specified for pressure-assist toilets. All the manufacturers were using the same pressure-assist technology in their pressure-assist fixtures. That technology? Sloan's *FLUSHMATE®* pressure-assist operating system.

Of course, you can't make a statement that for all conditions, pressure-assist works best. However, if performance is the criteria, fixtures with Sloan's *FLUSHMATE®* pressure-assist operating system do, in fact, work the best.

## About Joseph Smaul, P.E.

*With 44 years of experience, including the first 13 as a pipefitter, Joe Smaul has done it all — from running his own mechanical design contracting company for 16 years to doing consulting engineering for some of the most well-known engineering firms. He has patented energy conservation systems in office systems, and is a member of and frequent speaker at major trade associations in the United States. He is currently doing engineering work at Marvin Waxmam Consulting Engineers in Glenside, PA. To contact, or for more information on Sloan FLUSHMATE, call: 1-800-875-9116.*



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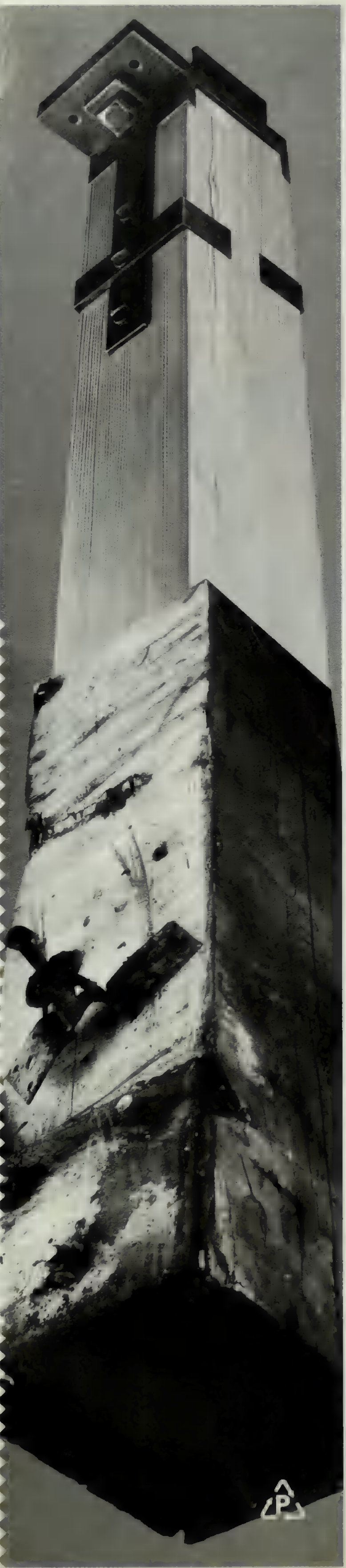

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## PRODUCT LITERATURE

### AutoCAD add-ons

New Nemetschek AutoCAD R14 modules, called Palladio X, include walls, openings, doors, and windows; stairs; roofs; building manager; structures; custom objects; and schedules. 800/479-0736. Nemetschek, Mill Valley, Calif. **CIRCLE 238**

### Custom accordion doors

Woodfold-Marco's accordion folding doors are displayed in a new 12-page brochure. 503/357-7181. Woodfold-Marco, Forest Grove, Oreg. **CIRCLE 239**

### Open-office planning

Panel Concepts' powered and non-powered panel systems and modular frame components, called Bottom Line, include work surfaces, storage, filing, and computer support. 800/854-6919. Panel Concepts, Santa Ana, Calif. **CIRCLE 240**

### Aluminum finishes

"Consider Your Options…Architectural Aluminum Finishes" provides details on a variety of finishes. 770/449-5555. Kawneer, Norcross, Va. **CIRCLE 241**

### Commercial roofing

AlliedSignal Commercial Roofing Systems' Millennium catalog includes spec information on roofing systems made with polymer-enhanced coal tar membranes and mastics. 800/221-6490. AlliedSignal, Cary, N.C. **CIRCLE 242**

### Skylight projects

The Skywall Translucent Systems brochure highlights recent projects that use skylights, including the Augusta Medical Center and The New York Times Newspaper Group. 800/869-4567. Skywall, Terrell, Tex. **CIRCLE 243**

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**Grout color selection**

Both Laticrete's 1998 product selection guide and the company's grout color selection chart are now available. 800/243-4788. Laticrete, Bethany, Conn. CIRCLE 244

**Energy-efficient software**

Energy-10 software for designing low-energy buildings was developed through an industry/government collaboration between the Passive Solar Industries Council (PSIC), the National Renewable Energy Laboratory (NREL), the Berkeley Solar Group, and the Lawrence Berkeley National Laboratory. Funding for the program was provided by the U.S. Department of Energy. PSIC wrote the Passive Solar Strategies manual, and NREL leads the development effort for Energy-10 software. 202/628-7400. PSIC, Washington, D.C. CIRCLE 245

**Spec sheets**

Wilamette's new product specification sheets describe the company's Southern plywood products (made from Southern pine veneer) and oriented strand board (OSB) products, which are available in a variety of grades for roof and wall sheathing. 541/926-7771. Wilamette, Albany, Oreg. CIRCLE 246

**Brick siding**

First developed in Quebec by the ALBA company and now distributed in the United States by the Allan Block Corporation, Nova brik is a mortarless, interlocking, brick siding system. The latest project to receive a Nova brik facelift is a seven-story, 90-year-old commercial building in downtown Calgary. 612/835-5309. Minneapolis. CIRCLE 247

**Automatic shutters**

Somfy Systems' newly revised brochure includes information on motorized control of rolling shutters. 800/66-SOMFY. Somfy, Cranbury, N.J. CIRCLE 248

**Segmental retaining walls**

VERSA-LOK's retaining wall systems construction details CD-ROM (version 6.0) contains drawings and specs that can be imported into CAD and word processing programs. 800/770-4525. VERSA-LOK, Oakdale, Minn. CIRCLE 249

**Decorative doorlights**

ODL's catalog features a variety of products, including the Lifestyles collection and Pro-Series Vents. In conjunction with the catalog, the company has also introduced a CD-ROM. 800/253-3900. ODL, Zeeland, Mich. CIRCLE 250

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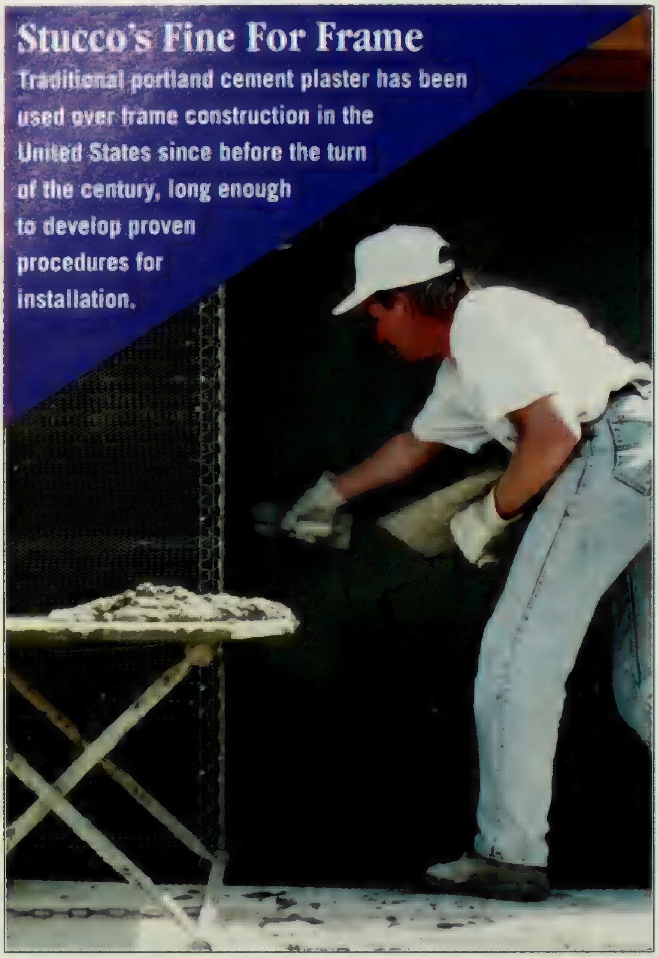
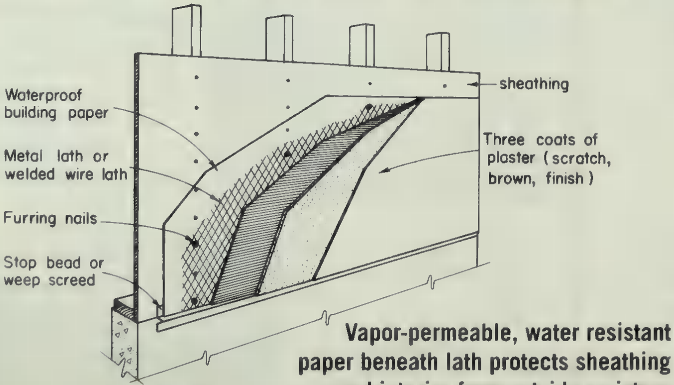
CIRCLE 46 ON INQUIRY CARD

# IT'S TIME TO RETHINK STUCCO



**Stucco's Fine For Frame**

Traditional portland cement plaster has been used over frame construction in the United States since before the turn of the century, long enough to develop proven procedures for installation.


sheathing
Waterproof building paper
Three coats of plaster (scratch, brown, finish)
Metal lath or welded wire lath
Furring nails
Stop bead or weep screed

Vapor-permeable, water resistant paper beneath lath protects sheathing and interior from outside moisture without trapping moisture vapor in wall

## The Real Thing

Traditional portland cement plaster is a time-tested exterior finish. It consists of portland cement-based materials and sand, mixed with water to form a workable plaster. Portland cement provides strength, durability, and toughness in portland cement plaster.

## It's Not the Same as Synthetic Stucco

Portland cement plaster (sometimes called "traditional stucco") should not be confused with exterior insulation and finish systems (EIFS) or "synthetic stucco systems." Traditional stucco has high impact resistance and sheds water, but breathes, allowing water vapor to escape. It's a proven system that works in all climates.

## Traditional Portland Cement Plaster ...It's A Hard System to Beat!

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*(continued from page 46)*

attending college or university schools of architecture, engineering, and architectural/construction engineering. For more information, visit www.interpane.com or call 800/334-1797.

**Youth Salon Competition**

*Submission deadline: August 4*

Architects and artists under 35 years old are eligible for this ideas competition. The challenge is to identify a problem in one's city, solve it with design, and evaluate the solution. For entry requirements or more information, visit www.makoto-architect.com.

**Fitch Charitable Trust Mid-Career Grants**

*Application deadline: August 15*

Research grants of $20,000 are being awarded to professionals in the fields of historic preservation, architecture, landscape architecture, urban design, environmental planning, archaeology, architectural history, and the decorative arts. Those with an advanced or professional degree and at least 10 years of experience are eligible. Smaller grants of up to $10,000 are also being awarded. Contact Morley Bland at Beyer Blinder Belle, 212/777-7800, for more information.

**Pier 40 Competition**

*Registration deadline: August 17*

*submission deadline: September 17*

The Van Alen Institute and a local community board are sponsoring a design competition for a 15-acre pier on New York City's Hudson River waterfront. The pier is at the center of proposals to turn the entire waterfront into green space. Visit www.vanalen.org for details.

**Boston Society of Architects Design Awards**

*Submission deadline: August (unbuilt awards); September (honor awards)*

The BSA's Architectural Design Honor Awards program is open to all Massachusetts architects' projects anywhere in the world and to all architects who have designed built projects in Massachusetts. The Unbuilt Architecture Design Awards are open to architects, architectural educators, and students anywhere in the world. Call BSA at 617/951-1433 x221; fax 617/951-0845; or E-mail bsarch@architects.org.

**Membrane Design Competition**

*Submission deadline: September 2*

This year's Membrane Design Competition, sponsored by Taiyokogyo Corporation, honors the creative design of airport structures using membrane. Write Membrane Design Competition, 4-8-4 Kigawa-higashi, Yodogawa-ku, Osaka 532-0012, Japan; fax 011/81/6/306-3154; or E-mail mh_001600@fc.taiyokogyo.co.jp.

**Shinkenchiku Residential Competition**

*Submission deadline: September 10*

Kyoto architect Shin Takamatsu will judge this year's ideas competition, sponsored by *Japan Architect* magazine. Winners' work will be published in the December 1998 issue of *JA.* To receive a copy of the rules, fax a request to 011/81/3/3811-0243.

**AIA Continental Europe Design Awards**

*Submission deadline: September 11*

Eligible projects are those built on the European continent and completed after January 1, 1993. For submission information, contact Frimmel Smith at frimmel@compuserve.com.

**Union Internationale des Architectes Student Competition**

*Registration deadline: September 15*

*Submission deadline: January 31, 1999*

In the spirit of the Istanbul Declaration on Human Settlements, student entrants are invited to design a housing project for a city in their home countries. In addition to cash, the winner will receive the UNESCO Prize for Architecture. To register, call Liu Kecheng at Xi'an University, in Xi'an, China, 011/86/29/220-29-43, fax 011/86/29/552-78-21, or E-mail LiuKCH@pub.online.xa.sn.cn.

**Wood Design Awards**

*Registration deadline: September 18*

Sponsored by the Wood Products Promotion Council, this competition honors outstanding wood projects in two categories: completed wood buildings and architectural woodwork interiors. Projects must have been completed since 1995. Contact the Architectural Woodwork Institute at 703/733-0600, fax 703/733-0584, or E-mail jdurham@awinet.org.

**auto.des.sys Design Competition**

The Acadiana Educational Endowment and software makers auto.des.sys, Inc. are sponsoring a competition to design the Louis Armstrong High School for the Arts in Acadiana, Louisiana. The competition is open to students worldwide and will take place in two stages over the 1998–99 school year. Call 614/488-8838 or E-mail formz@formz.com for details. ■

*Please submit information for exhibitions, conferences, and competitions at least six weeks prior to the magazine's publication date (e.g., August 15 for the October issue).*

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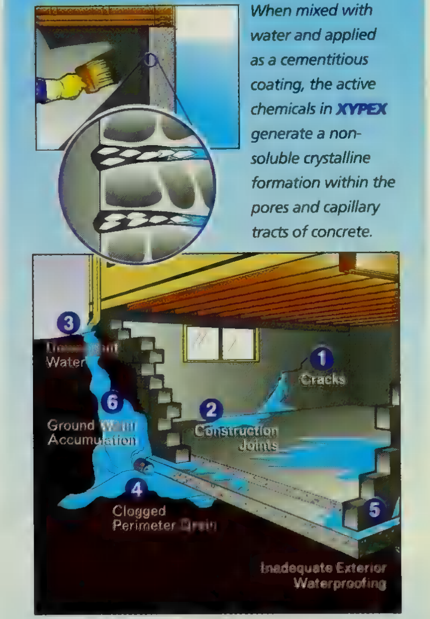

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CIRCLE 48 ON INQUIRY CARD

## AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

### Instructions

- Read the article "Understanding Accessibility Laws" (page 109) using the learning objectives provided.
- Complete the questions below, then check your answers (page 138).
- Fill out the self-report form (page 138) and submit it to receive two AIA Learning Units.

### Questions

**1.** Describe the scope of the ADA.

**2.** List the agencies that have jurisdiction over parts of the ADA, and which parts they handle.

**3.** Discuss the status of revisions to the ADA Accessibility Guidelines.

**4.** Explain the difference between the AIA's position regarding the architect's legal liability for ADA compliance and the Department of Justice's position.

**5.** Describe the advantages of having local codes certified.

Why build with cold steel when you can use the natural beauty of Parallam PSL timbers to create an aesthetic extension of your design. Now Trus Joist MacMillan offers you a line of heavy timber structural systems and the assistance of a national network of technical support. For information, call 1-800-661-6240 and ask for the Heavy Timber Group.

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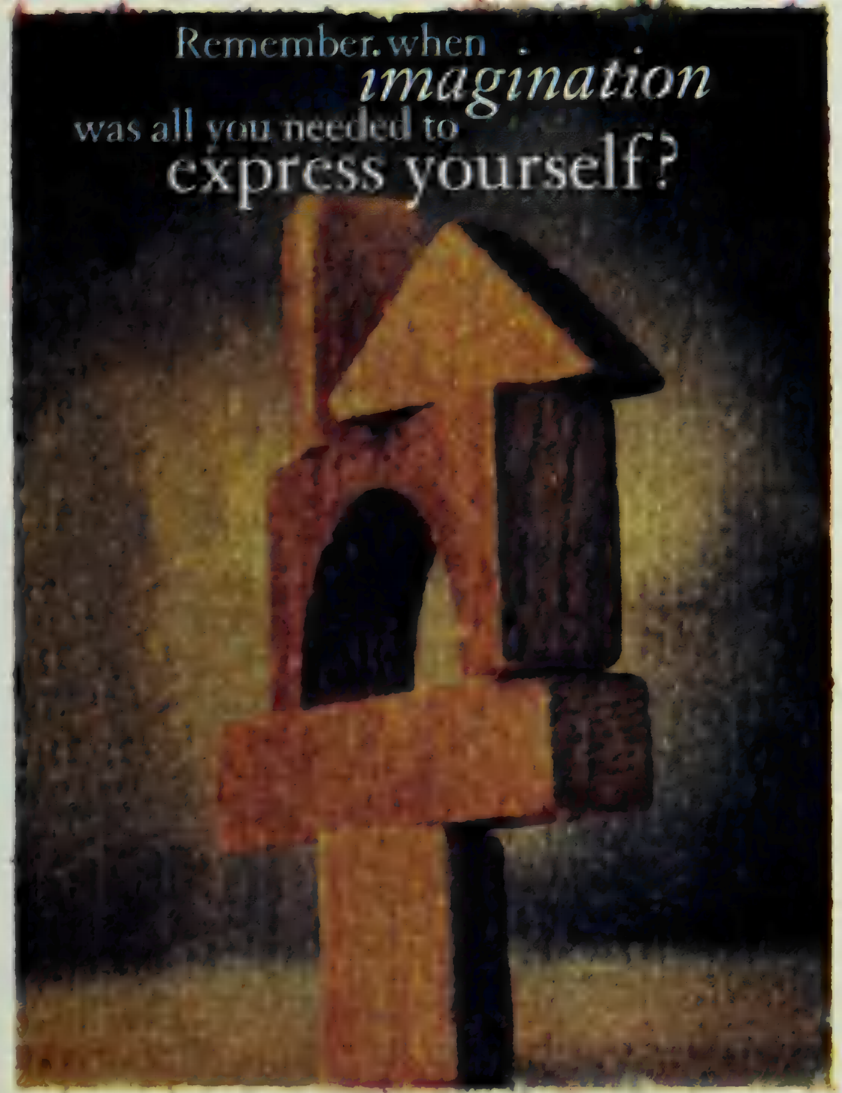

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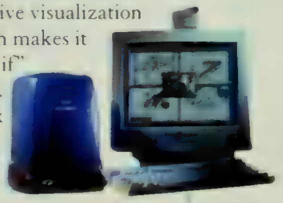

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**CIRCLE 50 ON INQUIRY CARD**

## AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

### ANSWERS

Questions appear on page 136. To receive CES credits, fill in the self-report form below.

**1.** The ADA is a wide-scope civil rights law that prohibits discrimination on the basis of disabilities in many spheres. Title I of the legislation addresses employment practices. Title II covers programs, services, and activities of state and local governments. Title III concerns public accommodations and commercial facilities. Title IV requires relay operators for telephone systems. ADA requires different levels of accessibility depending on the scope of the project: new construction, renovation, or alteration.

**2.** The Equal Employment Opportunity Commission handles regulations, technical assistance, and enforcement of Title 1. The Department of Justice does the same for Titles II and III, and can certify that a state or local code is equivalent to the ADA requirements. The Department of Transportation handles regulations, technical assistance, and enforcement of transportation requirements under Titles II and III. The Federal Commerce Commission oversees Title IV. The U.S. Architectural and Transportation Barriers Compliance Board develops the technical design guidelines and offers technical assistance on architectural, transportation, and communications issues.

**3.** The biggest complaint from architects was that they had to satisfy both ADA guidelines and local codes. Although both were based on the same ANSI standard, they were not identical. ADA guidelines are being rewritten to resemble CABO/ANSI A117.1 in organization and language. The proposed guidelines will be available for public comment by September 1998 but will not become law until the Justice Department incorporates them into its own standards.

**4.** Lawsuits have tested the intent and language of the law in several courts. The AIA's position is that the ADA did not intend for architects to be sued directly under the act. Architects are responsible for providing accessibility in their design for a reasonable standard of care, meaning situations are evaluated individually according to their circumstances. This is different from the position of the Justice Department, which is a strict standard of liability. Under the civil rights legislation, an architect would be liable if a violation is found, no matter what the extenuating circumstances.

**5.** No official is authorized to review a design in the planning stage for compliance with ADA; enforcement occurs after construction of the building is complete. Because of this lack of plan review, design changes are costly. The Department of Justice can review building codes submitted by state and local authorities to determine if they meet the same or comparable standards. Once a local code is certified by the Justice Department, local code officials can review architectural plans for accessibility compliance. If the project meets the local certified code, then it meets ADA, thus preventing the problem of discovering a design is noncompliant after it is built.

## AIA/CES SELF-REPORT FORM

*(Use to report learning units earned for ARCHITECTURAL RECORD only.)*

**Member information:**

**Last Name** **First Name** **Middle Initial or Name**

**AIA ID Number**

**Program/project title: Architectural Record (07.98)**

☐ "Understanding Accessibility Laws" (page 109)
*Completion date (M/D/Y):* ______ / ______ / ______

**Quality Level (QL) of this program:** Each article will earn you a total of 2 LUs at Quality Level 2. Fill in: ____ total LUs.

**Quality Level of each article is 2. Material resources used:**
Journal article. This article addresses issues concerning the health, safety, or welfare of the public.

**I hereby certify that the above information is true and accurate to the best of my knowledge and that I have complied with the AIA Continuing Education Guidelines for the reported period.**

**Signature** **Date**

Send completed form to University of Oklahoma, Continuing Education, AIA/CES, Room B-4, 1700 Asp Avenue, Norman, OK 73072-6400. Fax 405/325-6965. Or, to respond by E-mail, visit www.archrecord.com and click on Continuing Education. For additional information, call 800/605-8229.

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## Call for Entries

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**True vision. It looks to a higher standard of architectural excellence and architecture practice. What it creates inspires for generations. Take your place among the profession's most honored visionaries.**

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Entry deadline: 08.07.98

**Interior Architecture**
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**Regional and Urban Design**
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**Twenty-five Year Award**
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Call 202.626.7586 for detailed entry information.

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KEYNOTE SPEAKER,
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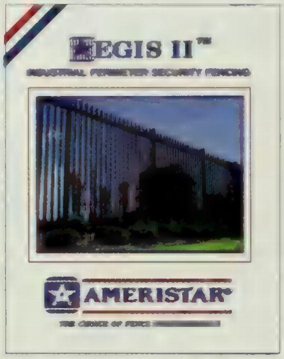
### AEGIS II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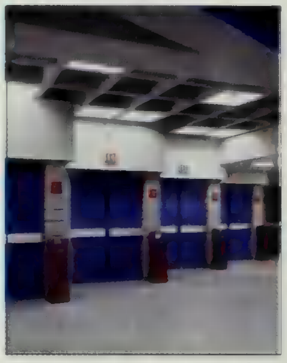
### Total Door® The Openings® Solution



Total Door® is a fire rated door assembly that includes all hardware. Pairs do not require coordinators, vertical rods, astragals, flush bolts, or floor strikes. Will retrofit to any frame. Meets all codes and ADA. Wood and metal faces available to 3 hours. Lifetime limited warranty on locks and panics. For more information call 1-800-852-6660.

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### New Fireplace Tested as a Wall Furnace

Our products have taken direct-vent technology & incorporated it into a new high performance fireplace. Model 6000 Supreme is a high efficiency fireplace (thermal efficiency up to 74%) & has an AFUE (Annual Fuel Utilization Efficiency) rating of 63%. The 6000 Supreme is standard with a variable regulator to adjust the flame & BTU input with the turn of a dial. Heat-N-Glo, 6665 West Hwy 13, Savage, MN 55378, 1-800-669-HEAT.

**Heat-N-Glo**

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### Mortar Net Weep Vents

are inexpensive and easily installed in weep holes to insure masonry cavity walls breath, drain and dry quickly. Made from 100% recycled polyester with a 90% open mesh in 2.5" x 4" x .5, they are available in white, tan , almond, gray, and brown. Weep Vents add to the beauty of the wall by duplicating the texture and color of mortar, thus eliminating open holes and dark shadows while restricting entry to insects. Call (800) 664-6638 for more information.

**Mortar Net**

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### Ornamental Picket Fence with a Purpose

We have given special attention to each & every component of our fence. Every item is designed for strength, durability and low maintenance. No other company builds a complete fence - rail, rivets, brackets, pickets and posts, that are stronger, more durable, have more security or lower maintenance costs than our fences. Monumental Iron Works, 6500 Eastern Ave., Baltimore, MD 21224. Tel: (410) 633-6500, Fax: (800) 239-2963.

**Monumental Iron Works**

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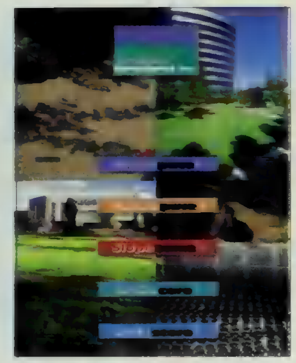
### New Invisible Products Roll Out



3 new invisible products have been added to the family of Grasspave$^2$ & Gravelpave$^2$ - Slopetame$^2$, Draincore$^2$, & Rainstore$^3$. For 16 years we have provided grass paving ring structures with 92% void area for root development. Now we're applying this technology to erosion control, drainage, & water storage with easy installation in 9 roll sizes. Call our knowledgeable staff for CADD details, specs, & product specs at (800) 233-1510. Web Site: http//:wwwinvisiblestructures.com

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Introducing Hatteras™ Shingle from CertainTeed, an oversized 18" x 36" fiber glass asphalt shingle designed to withstand hurricane force winds: features dramatic eight-inch exposure; deep one-inch shadow lines; seven colors; 10-year warranty coverage against winds up to 110 miles per hour; 40-year limited warranty; UL certified to meet ASTM D3462; algae resistant; Metro-Dade acceptance; meets BOCA building codes.

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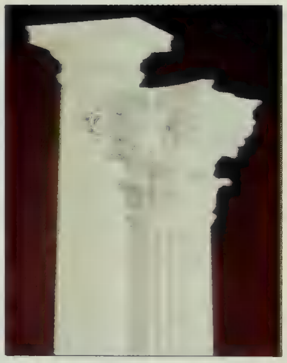
### Columns & Balustrades



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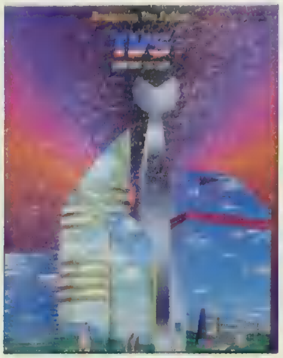

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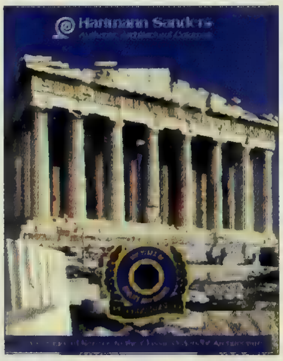

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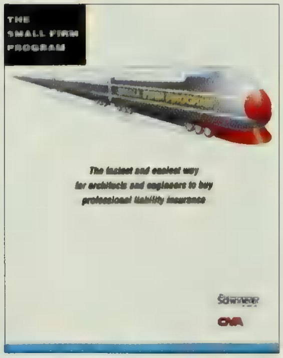
### Small Firm Program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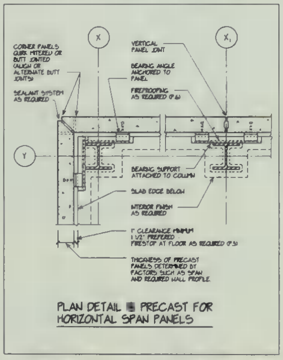
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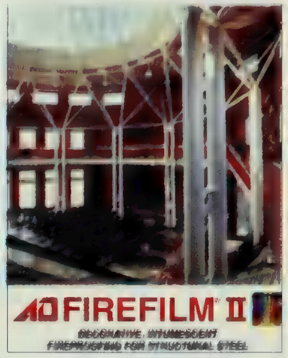

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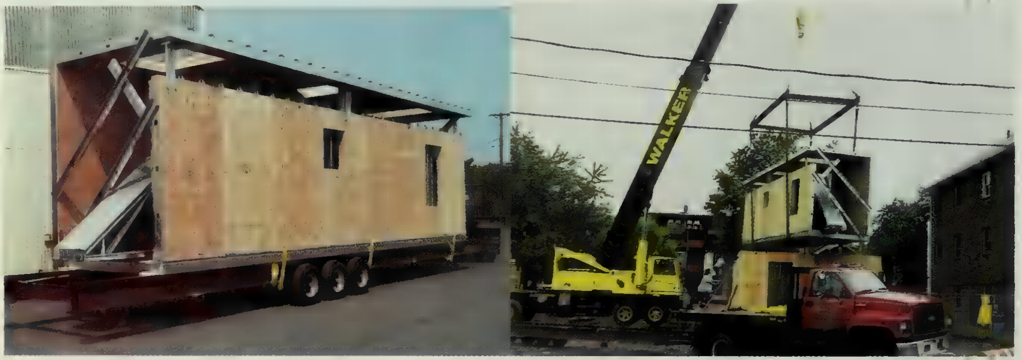
# THE FUTURE Combining steel, modular, and panel technology to create an efficient building structure

BY CHARLES BEVIER



**The panelized modular unit, with roof trusses inside (far left), is ready to be shipped. Once at the site, it is stacked on top of the first floor (left). The panelized home is completed (above).**

What if the building industry's future included an expandable structure that could be shipped to a job site in a compact form, and then popped up vertically and elongated? The use of a modular core, manufactured in a factory environment, would minimize up-front material costs, reduce on-site labor, and allow for quicker completion times. Toss in energy-efficient building materials, and this system could revolutionize residential and light commercial construction.

Developer Ray Kavarsky, president of Innovative Building Systems (IBS) in Berlin, Connecticut, has patented such a solution. It combines modular, panel, and steel technology to create a system where the structure's shell—with folding walls and a telescopic, steel-framed floor joist system—expands once it arrives at the building site. What's more, for better insulation, the envelope can include structural insulated panels (SIPs) with R-28 values.

"I've been working as a builder and developer for 30 years," says Kavarsky. "I've always liked steel because of its efficiencies. It's stronger than wood. It's impervious to insects. It doesn't warp, twist, or shrink. And it costs about the same as a good piece of wood."

Kavarsky had found that transporting modular structures was a real problem. Shipping units up to 16 feet wide and 80 feet long across state or county lines can be very expensive. In addition, negotiating the bureaucratic maze of state Department of Transportation permits, county or township permits, police escorts, flag cars and drivers, and bridge-crossing restrictions would tax anyone's patience.

This frustration was the trigger for Kavarsky's new building system. "I wanted to develop a structure that was no more than eight and a half feet wide by 13 and a half feet high," he says. "That way you can get down the highway without flag cars or special permits."

With IBS's framing system, the shell of the structure forms its own transport container. Made from 16-gauge steel C-studs, the shell costs between $12 and $15 per square foot to construct. In its folded-up position, the shell can be filled with steel roof trusses and other components, further simplifying transportation. "It's also great for overseas shipping," says Kavarsky.

Once shipped to the site, the modular core is picked up by a crane and set on the foundation. What was the top of the structure during shipping becomes a wall, which folds down once the unit is set. The telescoping floor joist system is then expanded to the full perimeter of the foundation footprint. The process is the same for second or third stories. Roof trusses are then added. The shell can be made weathertight in hours.

Architect Vito Caolo, AIA, president of Caolo & Bieniek Associates, in Springfield, Massachusetts, says he used Kavarsky's system for a post office because of its engineering and design capabilities. "It has a lot of advantages," says Caolo. "You can get the unit anywhere and it can be erected in a matter of weeks. And the way it's designed, it can be made to meet wind- or snow-load codes for any area."

Kavarsky's system has also attracted the attention of Steven Winter Associates (SWA), in Norwalk, Connecticut, which has been at the forefront of energy-efficient design for 25 years. Alexander Grinnell, principal at SWA, thinks Kavarsky is combining materials in an intriguing way. "Using SIPs as wall panels, for instance, eliminates a plethora of problems with connectors and fasteners that metal framing can engender. And SIPs solve the problems of energy and thermal loss exhibited by steel."

SIPs combine the structural system, wall and roof sheathing, and insulation in a single panel construction. They are made of a rigid foam core sandwiched between two exterior skins, commonly oriented strand board. The core can also be composed of expanded polystyrene, extruded polystyrene, Styrofoam, or polyurethane.

Kavarsky's adoption of SIPs is relatively recent. The post office and several single-family-home urban infill projects were completed earlier this year using traditional steel framing for the walls and batt insulation. Since adding SIPs to his system, Kavarsky says, he has seen increased interest in his product: "We're looking to do six more post offices in 1998, and we've had inquiries about commercial buildings and single-family homes." ■

*Charles Bevier is the editor of* Building Systems Magazine, *based in Lakewood, Colorado.*

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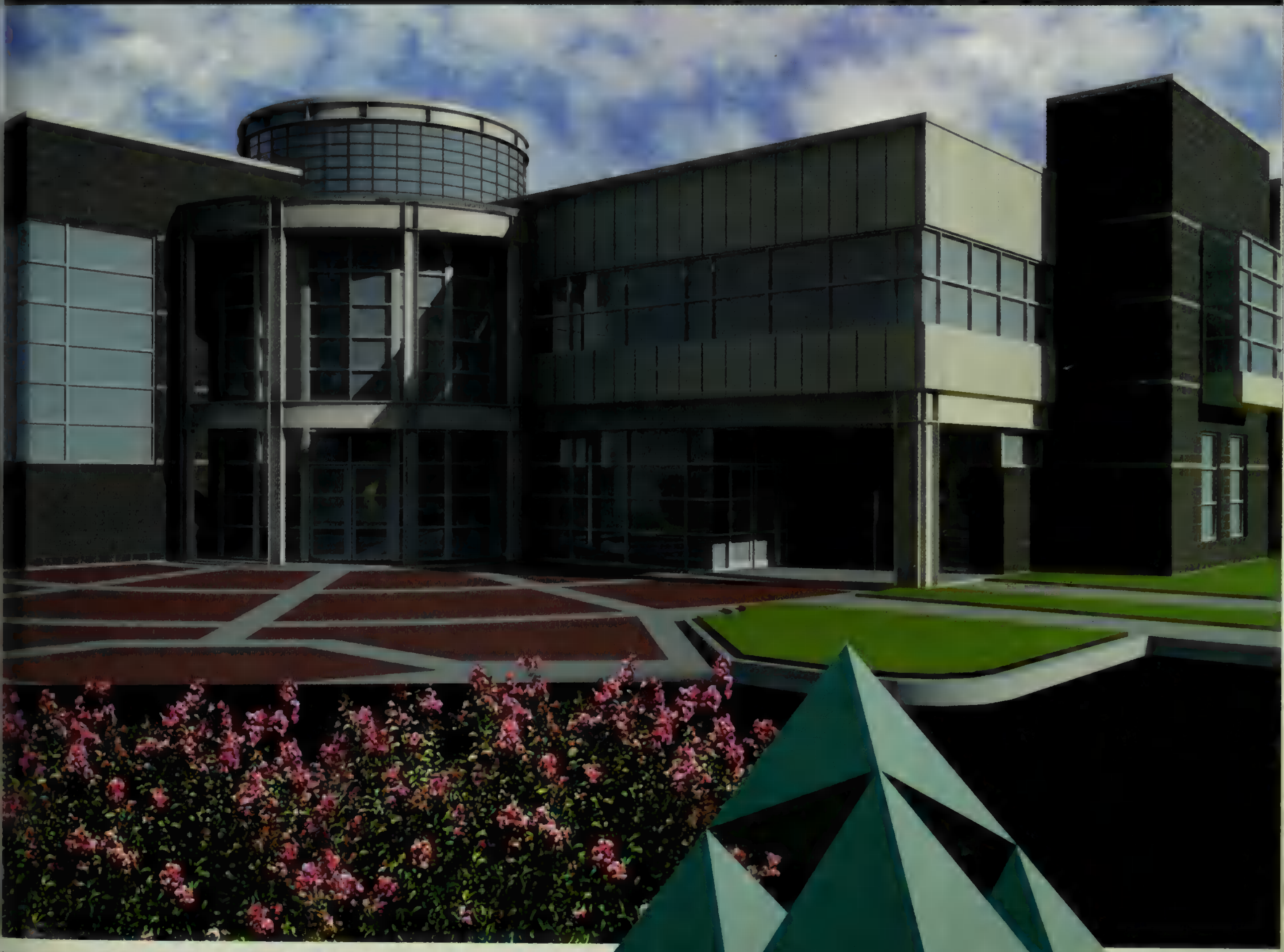

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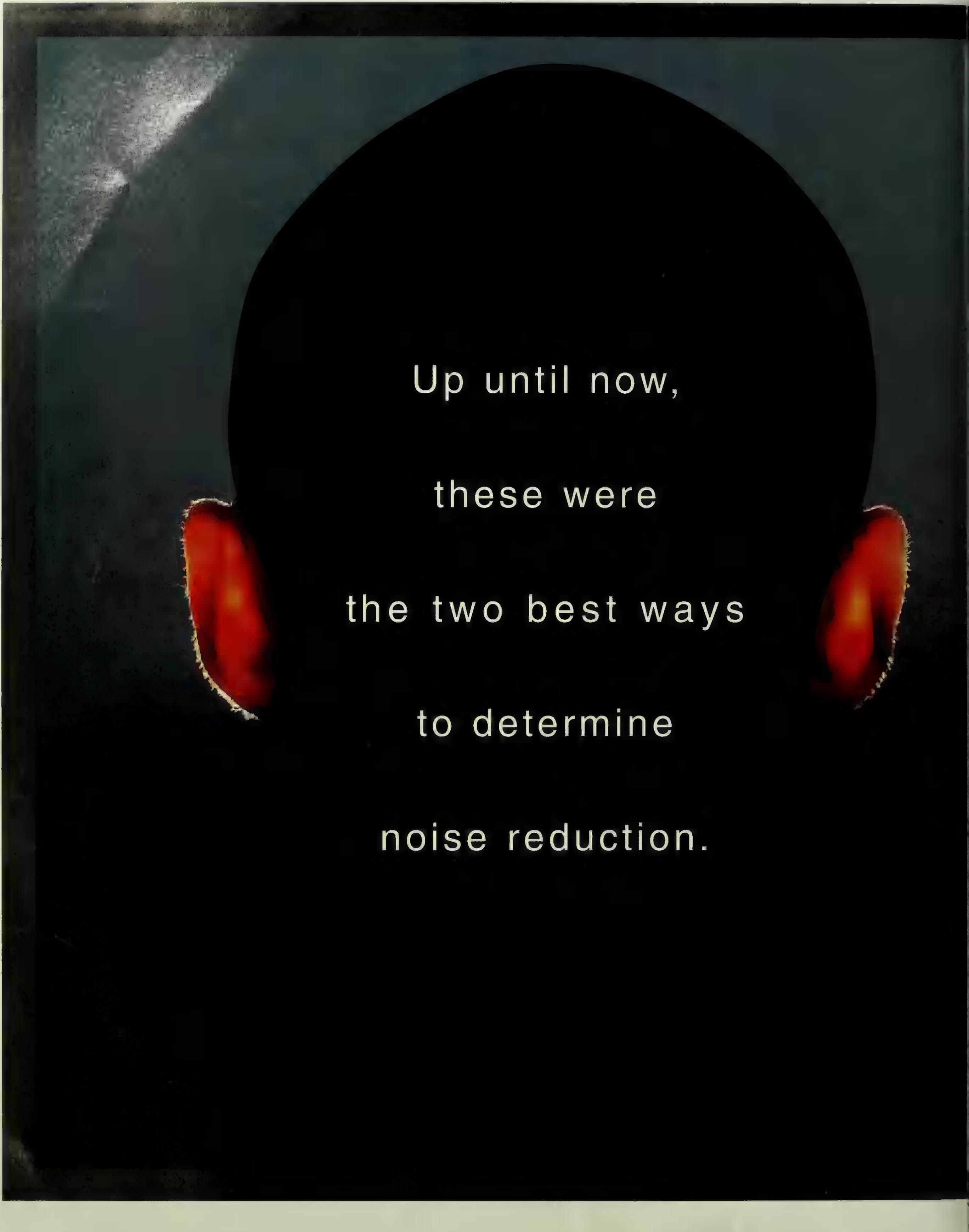
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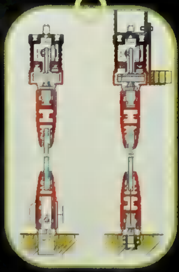

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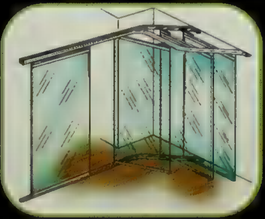

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**Continuing Education:** *The AIA/ARCHITECTURAL RECORD continuing education opportunity this month is "Improving Glass Performance" (page 131). The self-report form appears on page 198.*

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**Above:** *Addition to Lewin House, Santa Monica. Stephen Ehrlich Architects. Photo © Julius Shulman/David Glomb.*

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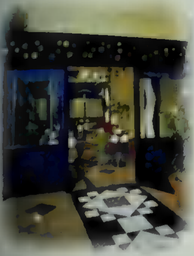

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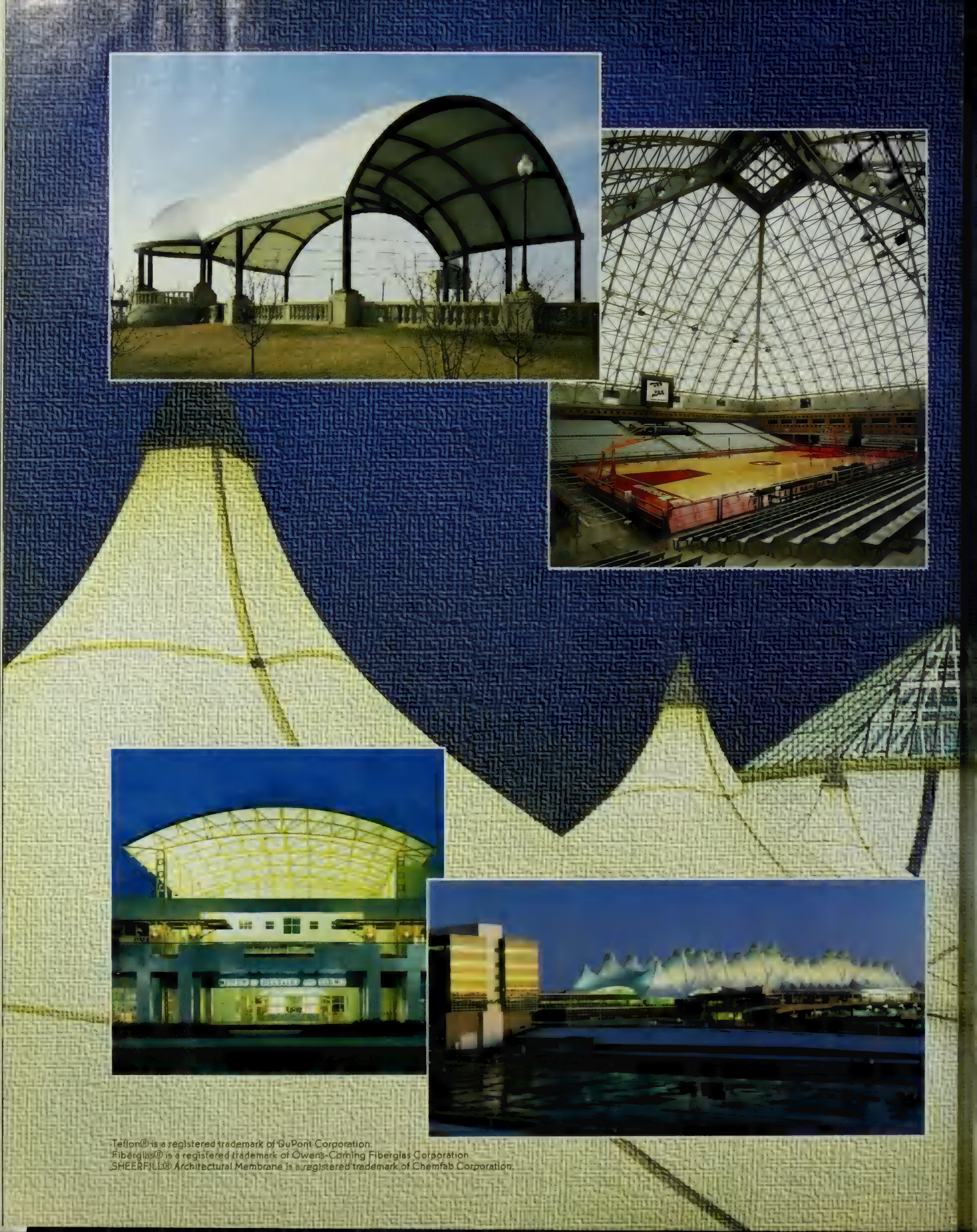

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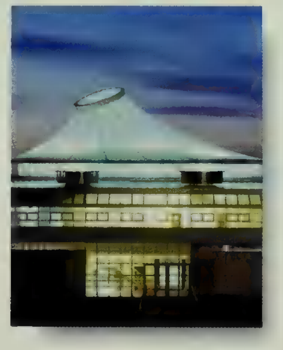

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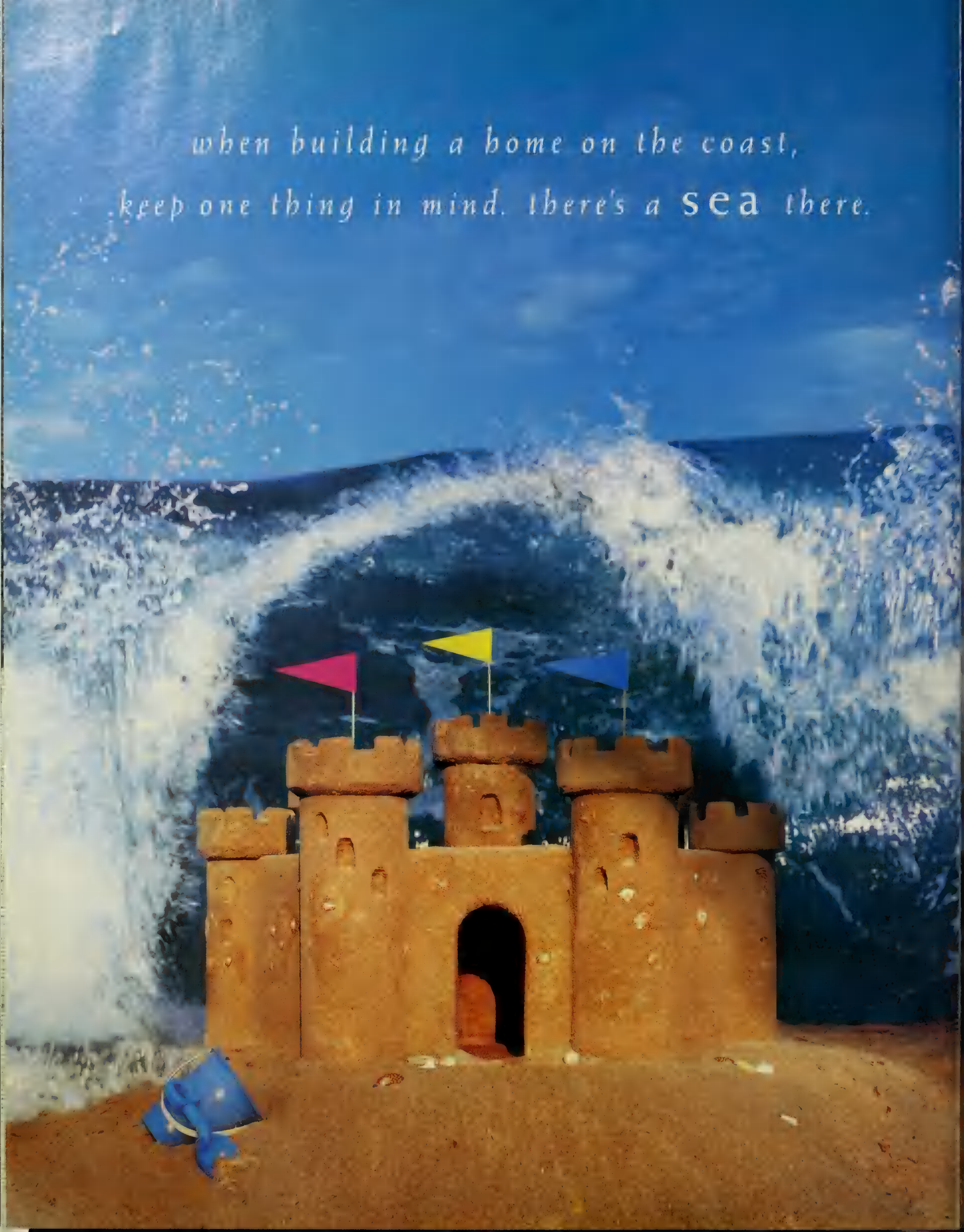
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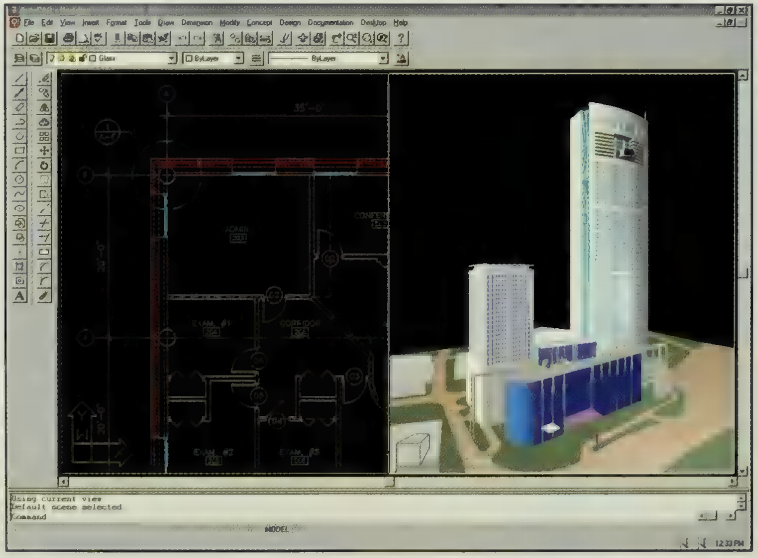
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# EDITORIAL

# The Critical Connection

BY ROBERT A. IVY, FAIA

*Who can forget the moment when the jury went sour? There you stood before your handiwork, a lone and vulnerable student, while one professor arched an eyebrow, posed a rhetorical question, then speared your project with a humorous flourish, leaving all of your careful reasoning in puddles, accompanied by the guffaws of the audience and a rising blush. Never again, you vowed, would you be subjected to such a moment.*

*Unfortunately, an abusive jury experience in the university, even a single bitchy critique, can color our subsequent opinions of the value of criticism. Upon graduation, we hope to flee the abstract confines of the studio and rush toward the positive rewards of real work. But employment is no panacea. If our offices lack noontime or Friday critique sessions, we may awaken to the realization that something vital is missing. Could we have lost the critical attitude the university system nourished?*

*For some in our optimistic profession, formal criticism can seem problematic, either ill-tempered ranting or arcane theorizing. To the general audience, criticism has negative connotations—the slam or the put-down. But recall your earliest days in the design studio, when a professor pinned up sketches and, without overwhelming the class, pointed out the subtle variations among them. Or when a visiting practitioner helped clarify why poor column spacing for an indoor hall inhibited the physically challenged. Your grand design, she pointed out, would not work. All of this specific help—the analysis, the evaluation, the judgment—resulted in the development of your individual critical attitude, both a point of view and an essential skill for a lifetime's practice.*

*Criticism can be a mature architect's intellectual lifeblood. For a designer whose current solutions seem locked in a dead-end corridor, criticism proposes options, a variety of answers within programmatic determinants. It offers responses from differing points of view, from the client to the larger society and from theory to history. Rather than relentlessly pejorative, good criticism is liberating, a framework that allows you to make up your own mind.*

*At* ARCHITECTURAL RECORD, *we have been judicious in doling out criticism. When it has appeared in this magazine, our critical writing has implied that a project deserved the effort, and when we have taken the trouble to evaluate a significant architectural project, as we do in this issue, we have employed credible writers to do so. Observers like Thomas Hines, a respected scholar, have enjoyed the liberty of a blank page. That tradition will continue.*

*As readers, you continue to express an interest in a critical voice in your publication. In partial answer to that desire, we are engaged in an ongoing exploration. Suzanne Stephens's comprehensive assessment of the state of architectural criticism in March 1998 laid the groundwork for debate. Plans are in the works for familiar writers and new talent to discuss interesting buildings, urban projects, social and cultural questions, and legislation that are worth the ink; the dialogue should spill over onto our Web site, where you can express your own points of view. In addition, we will gradually increase our own critical analysis of individual projects, with an eye toward journalistic clarity and broader understanding.*

*The result will be a continuing effort to heal the breach between the academy, architectural theory, and practice. Why, after all, should graduation disconnect us from a critical attitude, a hallmark of our education, when it can be a source of energy and strength and a useful tool for growth and professional development?*

Robert Ivy

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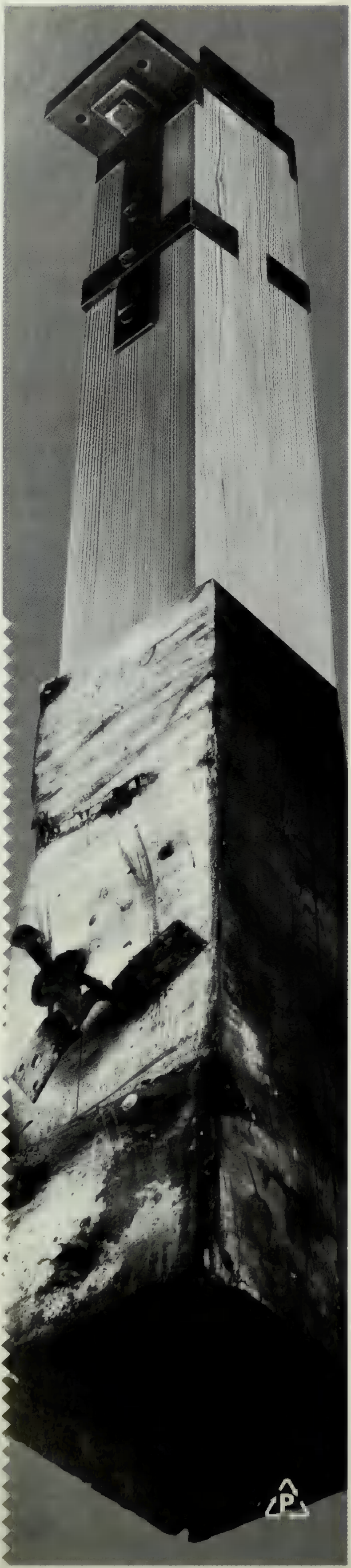

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CIRCLE 8 ON INQUIRY CARD

# LETTERS

### Future garages

It was interesting to read your article on robotic parking garages [The Future, June, page 232]. This technology is not new or, at any rate, it sounds very similar to the "pigeonhole" garages that we did back in the 1950s in Houston, Atlanta, New Orleans, and other cities. You might mention to Mr. Haag that customers in the 1960s really hated that operation. Given today's increase in the variety of vehicles and damage claims, I hope technology has come a very long way in the interim. Thanks for the report.

*—Charles Burgess*
*Houston, Tex.*

### Simple tastes

It is very difficult for me to believe that the owners of the New York City private apartment featured in the May issue's AIA Honor Awards [page 121] are anything other than victims of their architects' whimsy. Do they really agree, as the article stated, that "By eliminating almost all furniture and forgoing even the client's art collection, the design heightens a sense of separation from a hectic world"? I'll eat my words if the clients write to express their delight with the design; you eat the award if they say they've added a table or a chair, or have taken a painting or two out of storage!

*—Charles L. Campbell, AIA*
*Colorado Springs, Colo.*

### Speakers want to be heard

I was amused to read the article "Plaza and Free Speech Wall Take Center Stage on Iowa Campus" [June, page 117]. The information in the article differs so markedly from the reality on campus that I wondered if the project might actually be at another University of Iowa in another Iowa City.

Public speakers, rallies of all sorts, and other events have always been held on the Pentacrest—the central area of campus, bracketed by the Old Capitol, a pair of Beaux-Arts classroom buildings, and downtown Iowa City. Pedestrian traffic is heavy here, hence the popularity of the spot. By contrast, the new Kautz Plaza is a relatively obscure cul-de-sac with only a fraction of the foot traffic. To my knowledge, nobody uses it for public speaking, rallies, or anything of the sort your article implies, despite the earnest wishes of the university administration to get those sorts of activities out of public view.

It will be a long time, if ever, before the Kautz Plaza reaches the lofty goals of its designer and the not-so-lofty goals of the university administration.

*—David Arbogast*
*Iowa City, Iowa*

### Credits/corrections

In the May issue, Hector Velasco Facio should have been credited for the photographs of the Valeo Electrical Systems plant that appeared on page 215 and at the bottom of page 218.

The May issue's coverage of this year's AIA Honor Awards (page 103) neglected to mention that the San Francisco office of Skidmore, Owings & Merrill received not only an Architecture award but also an Interiors award for its renovation of the U.S. Court of Appeals.

The May story on construction logistics (page 239) misspelled Kubitz and Pepi, original architects of Logan Airport's Terminal E. Zimmer Gunsul Frasca designed the Doernbecher Children's Hospital in association with Anshen + Allen.

In the June coverage of the A/E/C Systems show and in that issue's software review (pages 171 and 176), Sigma Design was spelled incorrectly. ■

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CIRCLE 9 ON INQUIRY CARD

# SPEAK OUT Architects and engineers need to be educated together so they can learn how to work better together.

### C. HERBERT WHEELER, FAIA

*C. Herbert Wheeler, FAIA, is Professor Emeritus of Architectural Engineering at Pennsylvania State University. He earned a master's degree in architecture from M.I.T. in 1940, then worked as an architect and engineer until he became a professor in 1964.*

The two great design professions need to team up in the classroom as well as the workroom. Why? Because architects and engineers need each other, but they have lost track of each other.

It didn't use to be that way. The first half of this century saw a tremendous explosion in building technology. Electricity, plumbing, air conditioning, elevators, illumination, acoustics, computers—all of these advances led to the development of technical schools, which taught the latest theories and techniques.

Architects and engineers were educated side by side; after their schooling they teamed up to work in the fast-growing building industry. The professions of architecture and engineering as we know them came into being, and states began registration processes for both professions.

Unfortunately, the disciplines grew in different directions. The building industry soon became a factionalized place where planners planned, designers designed, and constructors constructed—all at breakneck speed.

Early on, amid this nascent chaos, the building industry's organizations saw the need to plan and control their future. Leaders of the architectural profession prepared a much-needed study, "The Architect at Mid-Century." This paper addressed almost every aspect of architectural practice and education—without mentioning the work of engineers.

The study also made over 40 recommendations, all of which were constructive except one. That particular piece of advice called for the abandonment of the title "architectural engineering" for any educational course focusing on architecture. It was recommended that "instruction in certain specialized phases of buildings should be designated as Building Engineering."

Certainly, the authors didn't imagine how much time and money would be spent on structural systems, foundations, soil analysis, fire protection, acoustics, and other technical characteristics of a modern building.

As a result—although the question arose whether architects and engineers would organize to practice together or continue on their separate paths—educators did not create programs that fostered interprofessional cooperation.

The failure to collaborate has caused the professions to drift too far apart. Architects are not unaware of the problem; several years ago, they asked the Carnegie Foundation to examine the educational aspects of modern architecture. In 1996 the foundation published a highly regarded study, "The Building Community—A New Future for Architecture Education and Practice."

The study is thorough and clear. It suggests a greater exposure to practical architectural experience in school, cooperation between educators and practitioners, and a better understanding of the business of architecture. It states that "the worlds of architecture practice and education depend on each other for their purpose and vitality."

But the study declared the need for the unification of the architectural profession without mentioning the word engineering or even acknowledging the close working relationship between architects and engineers.

What can we do to bring architects and engineers back together? A new collaboration must be facilitated. The time is right for a different study: an extensive, multidisciplinary look at the role of what could be called the "prime professional for an architectural project." The prime professional, a client-oriented project management position, is a multifaceted, modern job description. The Interprofessional Council on Environmental Design, for one, could mastermind such a study.

New ways of producing projects, such as design/build, are emerging as a natural evolution of the marketplace. But instead of letting nature take its course, architects and engineers must take charge of their own destiny by redefining how they work together—and, as a necessary prerequisite, how they are schooled to understand one another. ■

**Contributions:** *If you would like to express your opinion in this column, please send submissions by mail (with a disk) to Speak Out, Architectural Record, Two Penn Plaza, New York, N.Y. 10121; by fax to 212/904-4256; or by E-mail by visiting www.archrecord.com and clicking on News/Features/Dialogue. Essays must not exceed 700 words. The editors reserve the right to edit for space and clarity. Where substantial editing occurs, the author will receive text approval.*

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CIRCLE 10 ON INQUIRY CARD

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# **MENTORS** A family-run firm in Los Angeles has a time-tested strategy of collaborating with engineers throughout the design process.

*David C. Martin, FAIA (top), is a design partner at AC Martin Partners in Los Angeles; his cousin, Christopher C. Martin, AIA, is a managing partner at AC Martin. Their grandfather, Albert C. Martin, founded the firm in 1906.*

*How to work and communicate best with engineers is not a new topic for architects, but it is still a relevant one.* ARCHITECTURAL RECORD *asked David and Christopher Martin to discuss the process they use to integrate architecture and engineering from a project's beginning.*

When our grandfather founded AC Martin Partners in Los Angeles in 1906, he was an architectural engineer working in a fast-growing city with frequent material shortages. This didn't slow him down. Lacking the steel needed to build a movie palace for Sid Grauman, he used his engineering skills to develop a new system of reinforced-concrete construction.

This innovation came about as a result of integrating the design professions; these days, in a very different marketplace, the same kind of advances can be made with the right collaboration between architects and engineers.

A truly integrated process is not linear; it does not begin with a program, move to design, transfer to engineering, and conclude in a solution. Instead, the process we have developed involves "thinking simultaneously": solving architectural and engineering problems at the same time.

This constant collaboration between the disciplines, unusual in a midsize regional firm, is the way we meet the many challenges common to our profession, such as deciding whether a renovation is feasible, figuring out how to work within a limited budget and maintain design excellence, and learning how to cater to the environmentally conscious needs of today's builders.

During the Postmodern era, the separation of the disciplines often resulted in expensive engineering solutions for architectural embellishments. The current era, however, once again celebrates design that expresses its construction and purpose. The poetry of a design idea includes the technical resolution.

With this in mind, in our office even early sketches have been through an architecture and engineering filter. For us, a beautiful design has to have integrity and be buildable.

The built expression of the integration of the different disciplines results in richer architecture. After all, architecture and engineering are really part of the same discipline—namely, building.

Sometimes structural engineering actually directs the design process. For example, with our recent renovation and seismic rehabilitation of Los Angeles City Hall, the focus was on the structural system, which protects the building from a possible seismic event by creating a plane of isolation at the base. Because we understand the original expression of structure in the architecture, our design solution for this and other renovations can be respectful, not brazen.

Simultaneous thinking also offers a balance that appeals to technology-driven clients. Early on in our firm's development, high-rise, aerospace research, and computing center clients required an integrated process that met precise seismic and air-conditioning standards for continuous operation. Currently, we find that university and government labs require facilities that fit into strong campus contexts while remaining adaptable to tomorrow's technologies.

Sustainable design is also growing in importance, and an integrated approach is key to designing buildings that are more environmentally friendly. Even when budgets ar modest or furnishing selections are outside the architects' contract, sustainability goals can be achieved. The simultaneous approach assure that energy savings can be accomplished and that the design is not compromised in the process.

"Green" environments are just the beginning. Thinking simultaneously is a flexible and dynamic approach that we believe will move the design disciplines into the futur on a more steady footing.

The simultancous process is a method that has allowed us to renovate important landmarks, meet strict budgets in a changing economy, design buildings for long-term sustainability, and create humane environments for design-conscious clients and users. ■

**Questions:** *If you have a question about your career, professional ethics, the law, or any other facet of architecture, design, and construction, please send submissions by mail to Mentors, Architectural Record, Two Penn Plaza, New York, N.Y. 10121; by fax to 212/904-4256; or by E-mail by visiting www.archrecord.com and clicking on News/Features/Dialogue. Submissions may be edited for space and clarity.*

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CIRCLE 11 ON INQUIRY CARD

# PULSE RECORD readers were asked: Do architects make good clients?

**Yes:** A client who has a foundation in design is more inclined to understand the contract and fee-collecting process of design. If the client has theoretical and conceptual design experience, not arrogance, it's a bonus.
*—Venkatesan Cadambi*
*WLC Architects*
*Rancho Cucamonga, Calif.*

**Yes:** Under the right circumstances, architects can make the best clients. Owners such as public agencies or corporations, through their in-house architect representatives, are becoming increasingly sophisticated in terms of their knowledge of facilities. They are well aware of issues such as sustainable design, quality interiors leading to increased productivity, life-cycle costs, and other building performance considerations. Design firms that want to apply new technologies and innovative design approaches can do so to a greater extent when a client fully understands what the designer wants to accomplish. The client can then team with the designer to reach a common design objective.
*—Terrel M. Emmons, FAIA*
*Chief Architect, Naval Facilities Engineering Command*
*Alexandria, Va.*

**Yes:** The client who is an architect can understand the architectural aspects better than the client who is not an architect. The only exception is a hasty client.
*—Maria Tatai*
*Budapest, Hungary*

**Yes:** Often our firm is its own client for projects that we develop, design, and build. In these instances, we struggle with the same issues that most clients deal with. Although the additional architectural expertise that we bring to the role of client is helpful, it must be balanced by the necessary knowledge and skills of a client. The same is true for clients other than ourselves. Our most successful clients understand a great deal about the architect's needs in a project.
*—Brad Buchanan, AIA*
*Buchanan Yonushewski Group*
*Denver, Colo.*

**Maybe:** Architects make good clients only if they allow the architect to be an architect and the client to be a client.
*—K. Scott Roberts*
*Hampton, Va.*

**Maybe:** The client-architect is dependent on the professionalism of the hired architect and must learn to sedate his or her ego. If this does not occur, the hired architect must still take the high road. And even if the client is difficult to deal with, the architect may grow sharper from the conflict.
*—Miles Battle*
*Giuliani Associates*
*Washington, D.C.*

**Yes:** As clients, architects can better understand process and design concepts. Most design decisions in practice are driven not by administrative bureaucracy, but by the inspiration of creative thinking. The success of our profession depends on the natural creative tendencies that nurture the quality of projects.
*—Alfredo R. Trevino*
*Marziani and Associates*
*Newtown, Pa.*

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**This Month's Question**

## Are ADA requirements difficult to understand and put into practice?

The Americans with Disabilities Act (ADA), enacted by Congress in 1990, is a civil rights law that prohibits discrimination on the basis of disability. Since enactment, a number of lawsuits have been filed testing the intent and language of the law. Although the law helps define accessibility, architects must refer to a variety of regulations and guidelines, which are continually being updated, to interpret what constitutes compliance with the ADA.

**Are ADA requirements difficult to understand and put into practice?** ☐ Yes ☐ No

Copy and fax this form to 212/904-4256; or, to respond by E-mail, visit www.archrecord.com and click on News/Features/Dialogue.

*Note: Pulse reflects individual responses to each month's question and is not meant to be construed as formal research.*

**Let us know your opinion:**

**May an editor contact you for comments?**
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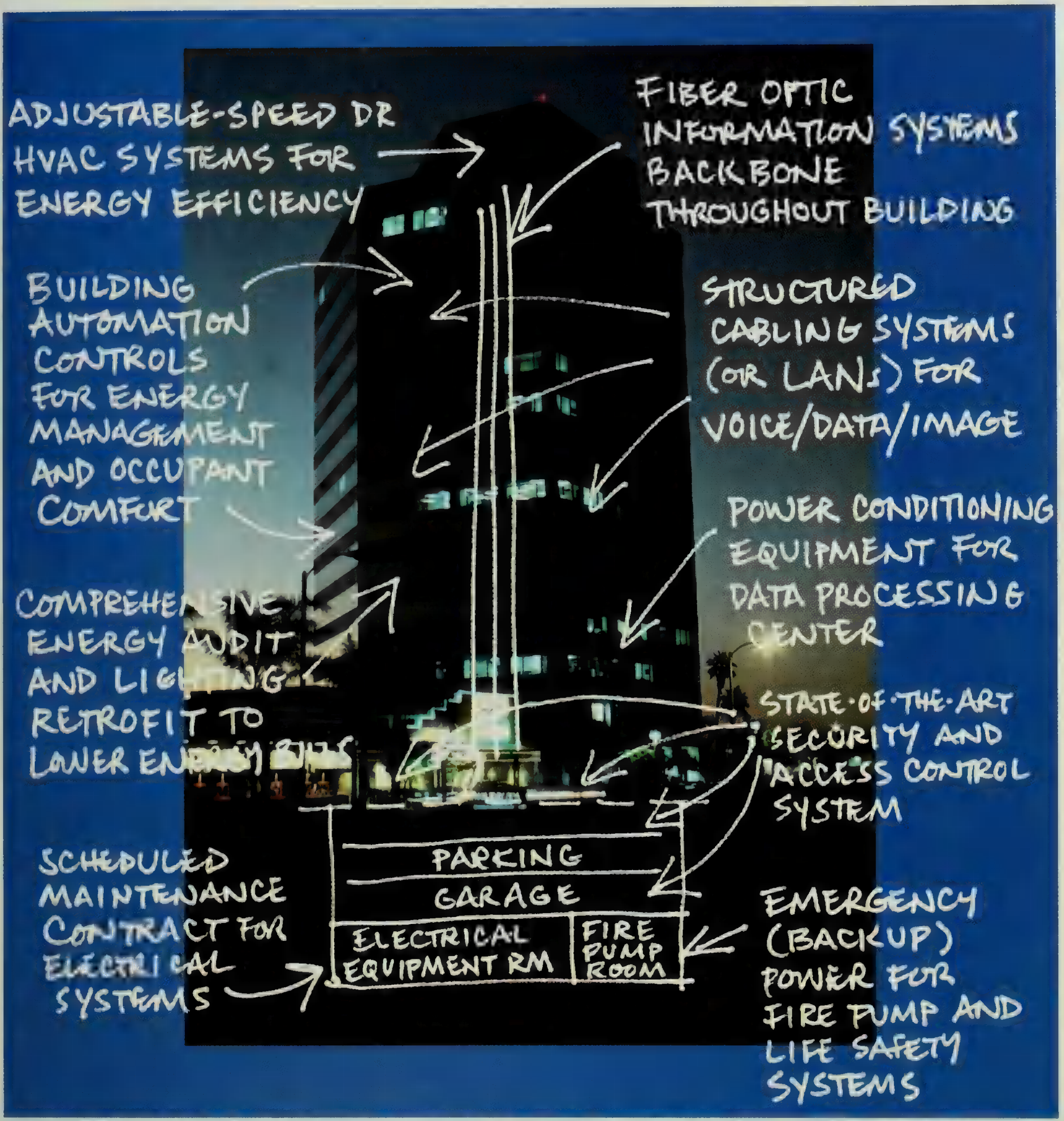
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CIRCLE 12 ON INQUIRY CARD

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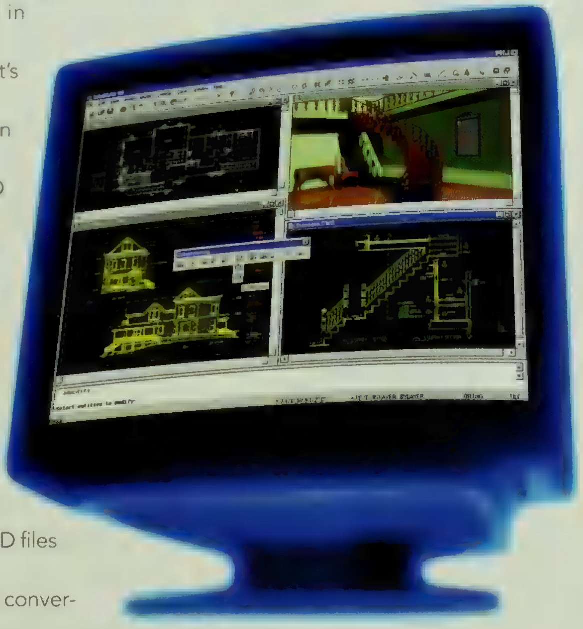

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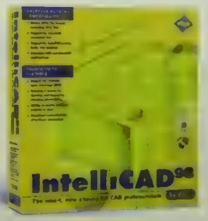

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**CIRCLE 13 ON INQUIRY CARD**

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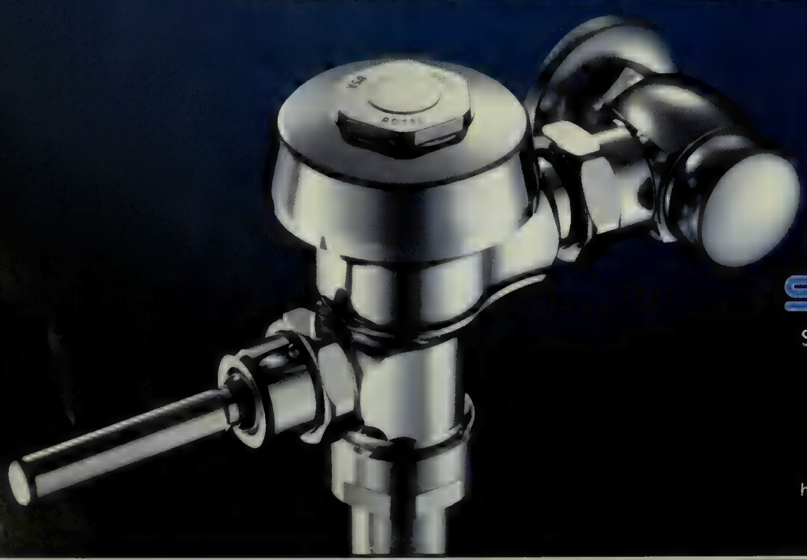

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CIRCLE 14 ON INQUIRY CARD

# **CORRESPONDENT'S FILE** Lisbon's world's fair provides a dramatic display of modern design that offsets the city's declining historic core.

### BY DAVID COHN

*David Cohn is an international correspondent for* ARCHITECTURAL RECORD *and lives in Madrid, Spain.*

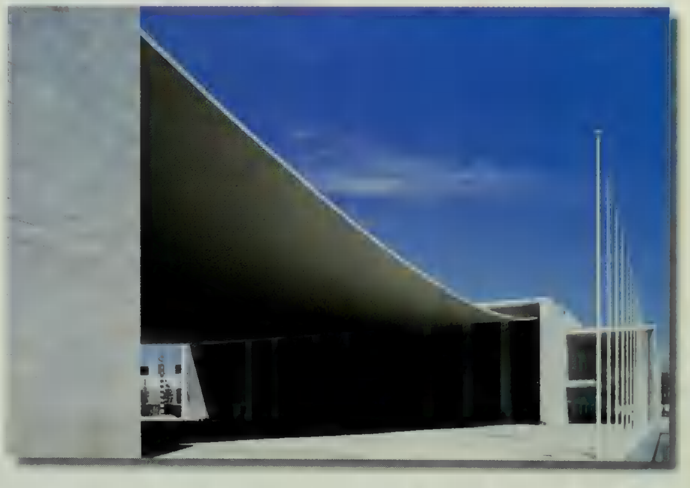
Expo '98, the world's fair that opened in Lisbon on May 22, is a contemporary rite of passage for the Portuguese capital. Following nearly a decade of solid economic growth, it represents the city's official debut in the world marketplace. The fair is also part of Lisbon's bid to join the exclusive club of prosperous city-based regions that are emerging, in the face of fading national borders, as the basic economic units of the European Community.

Portugal was one of the 11 nations that met the stringent criteria for monetary union within the Community. But it remains the second poorest member, held back by the effects of nearly 50 years of dictatorship, which ended with the bloodless Revolution of the Carnations in 1974, as well as the disastrous economic legacy of its African colonies, abandoned the same year.

The Expo thus attempts to bridge a gulf between Lisbon's past and its future, between pessimism and optimism, decline and growth. The gulf is expressed in the physical face of the city, in the contrast between its untouched but declining historic core and the invigorating but chaotic new developments on its periphery.

The Expo stands beside a wide estuary of the Tagus River on 150 acres of obsolete industrial land expropriated and cleared by the government. Just two miles from the airport, it is accessed by an ample new network of roads, a new subway line, rail links, and the spectacular 10.8-mile Vasco da Gama suspension bridge over the Tagus. The site is part of an 815-acre public development project designed to draw future growth to the area, in the spirit of Barcelona's 1992 Olympic Village.

The Expo grounds and many of its facilities will also serve as a future urban nucleus. When the Expo ends September 30, the temporary pavilions will give way to blocks of luxury housing, hotels, office buildings, a private hospital, and schools, while other pavilions will become permanent attractions. Waterfront restaurants and a marina will be joined by a 200-acre waterside park with sports and recreational facilities. The Expo's western gateway encompasses the future base of a 65,000-square-foot shopping center.



**Siza's canopied ceremonial square features a 212-foot-long suspended concrete slab.**

The sites bordering the fairgrounds will also become part of the future urban development. A new office building is occupied for now by Expo administration, and newly constructed housing is being used by representatives of participating countries. Hotels are also being built. The realistic planning by the public consortium that supervised the scheme reflects the lessons learned from Expo '92 in Seville, where a planned post-fair high-tech research park failed to materialize.

The Expo, which is dedicated to the world's oceans and commemorates the 500th anniversary of Vasco da Gama's voyage around the Cape of Good Hope, reaffirms the essential themes of Lisbon's history and identity. Visitors can survey the grounds and river from the high platform of Santiago Calatrava's grandiose intermodal transportation station, under an airy, treelike canopy of glass supported by white steel masts.

As the city addresses the river from the grand open space of Marques de Pombal's neoclassical Comércio Plaza, built after the 1755 earthquake, the heart of the Expo is a riverside water plaza fronted by Álvaro Siza's Portuguese Pavilion, the site of evening fireworks and music.

The general tone of the Expo architecture is modern, crisp, and restrained, often tinged with Sizian mannerisms—the idiosyncratic formal moves, like playful cutouts or projected screen planes, that Siza, Portugal's preeminent architect, makes startling and interesting. Its colors, especially the marble and stucco of Siza's Pavilion, capture the light of the old city, which Portuguese writer José Cardoso Pires once described as "white tempered with pearl and ash."

The Portuguese Pavilion is the Expo's most original and compelling work of architecture. The only work that looks back from the futuristic premises of the fair to the past, it combines the optimism of the event with a nostalgic evocation of familiar, predevelopment values of civility and tranquility.

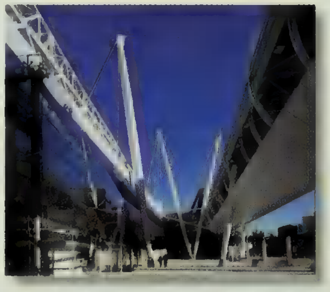
Siza's generous waterside portico is an intimate and welcome refuge. Visitors rest on the continuous marble bench that forms the base of the building, or enter through a pair of doorways to a small cafeteria, like in the bar of an old provincial train station. On the opposite side of the building, a row of simple balconied windows on the upper floor, where international dignitaries are received, assumes the civic dignity of a provincial town hall.

Perhaps equally as daring is Siza's canopied ceremonial square beside the entry to the exhibits. The square is shaded by a thin, suspended concrete slab, which drapes in tension across a clear span of 212 feet, an engineering feat accomplished in collaboration with Cecil Balmond of Ove Arup and Partners. Siza's detailing allows indirect daylight to bathe different surfaces and model the shadows, creating a magical sense of positive spatial presence. The building will become the headquarters for the Presidency and Council of Ministers of Portugal after the fair closes.

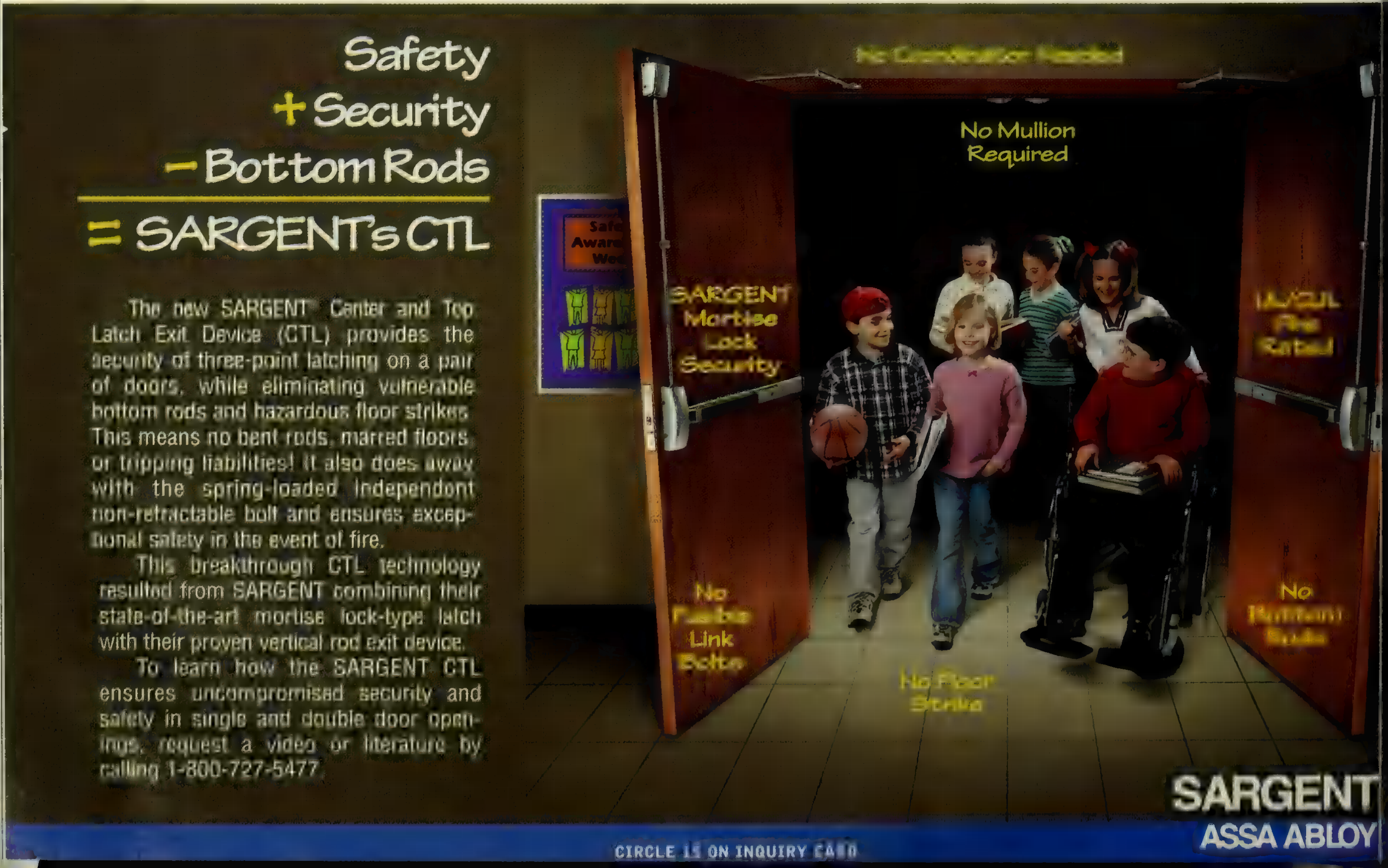
The water plaza is flanked on one side by the Utopia Pavilion, a 12,000-seat multiuse auditorium designed by Skidmore, Owings & Merrill's London office and local architect Regino Cruz. It features an awkward rubber-colored elliptical dome supported by boatlike interior wood trusses. SOM also designed the 400-foot Vasco da Gama observation tower and restaurant at the northern edge of the grounds.

Peter Chermayeff's Oceans Pavilion (see page 106) is "docked" on the other side of the plaza. Entered via an inclined gangway, its cubic volume is topped by masts and petal-like glass-and-steel canopies.

The 430,000-square-foot North International Pavilions, host to nearly half the 150 participating countries, are slated to eventually become trade fair exhibition halls. Designed by António Barreiros



**The classic look of the restored Chiado neighborhood (left); the North International Pavilions, with their angled masts and cables.**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Ferreira and Alberto França Dória, they offer a pleasantly extravagant display of undulating space frame roofs supported by angled masts and cables, with fabric elements and moving walkways housed in elevated metal tubes. As is the case with the temporary pavilions that house the other participating countries, exhibits are accessed from the shaded exterior perimeter.

The elegant "Knowledge of the Seas" Pavilion was designed by João Carrilho da Graça as a spare intersection between a floating horizontal plane and a vertical slab. It will become the Museum of Science and Technology after the Expo.

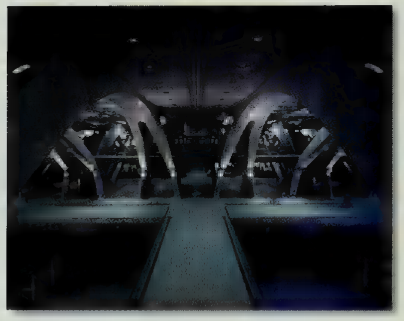
The Expo is not the only sign of vitality in Lisbon. With a population of one million, the city is ringed by crowded new working-class bedroom communities, and the nearby resorts of Sintra, Cascais, and Estoril have become expensive suburbs.

Postmodern bank headquarters clad in exotic stones stand along Berna Avenue, near the Gulbenkian Museum, while riverside warehouses have been converted into lively and fashionable nightclubs and restaurants.

In Belém, beside the Tagus west of the city center, a mammoth cultural center designed by Vittorio Gregotti—with a concert hall, meeting facilities, and a contemporary art center—was built in 1992 to host Portugal's Presidency of the European Community.

However, the heart of the old city has been largely passed over by the new prosperity. In February the city's annual survey of 1,200 structures on its "watch list" found 134 buildings "in imminent and irrecoverable ruin" and 180 in "critical condition." Structural collapses are an almost weekly occurrence. Improvements are hampered by prerevolutionary rents and antiquated legislation.

The problem was brought into sharp focus in 1988 when a fire destroyed 18 buildings in the Chiado. This old literary neighborhood stands at the edge of the Pombalian center, beside the famous Santa Justa elevator, an area of great sentimental value for Lisboans. Siza was called in to oversee a reconstruction that would preserve the spirit of the historic area, a project now nearly complete.



**Santiago Calatrava's intermodal transportation station near the Expo.**

Siza restored and rebuilt the severe Pombalian facades. He limited the depth of new constructions to open a system of intimate mid-block passages and patios to the street, utilizing the sharp changes in level over the precipitous terrain. And he designed a simple vaulted subway station and personally supervised the reconstruction of the Empire-style Grandella Department Store. The Chiado Department Store—where the fire started—is still under reconstruction as a commercial center and luxury hotel.

The project is a portrait in miniature of the dilemmas of renewal. Beloved old businesses such as the Ferrari pastry shop, lost in the fire, or the 19th-century Ferin bookstore, with its fragrant sandalwood bookcases, have been replaced by reconstructed buildings housing anonymous boutiques bathed in halogen light and ambient music.

The Expo brings an optimistic sense of the future to Lisbon. But only time will tell if the Chiado's traditional, delicate urban fabric can thrive behind its restored facades. ■

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# DATESEVENTS

## Calendar

**The Inflatable Moment: Pneumatics and Protest in '68**
**New York City**
*Through August 29*
An exhibition focusing on the French architects and activists Utopie. Also on display are models by Archigram, Frei Otto, Gernot Nalbach, and Coop Himmelblau, as well as structural fragments of built pneumatic projects. Architectural League of New York. 212/753-1722.

**Selections from the Design Resource Center**
**New York City**
*Through August 30*
An exhibition celebrating the Cooper-Hewitt's new resource center presents a rare opportunity for visitors to learn about the curatorial departments. On view are important holdings in furniture, books, textiles, and wallcoverings. Cooper-Hewitt National Design Museum. 212/849-8300.

**Forma Italia**
**Chicago**
*Through September 6*
An exhibition of Italian furniture, lighting, and industrial design from the permanent collection of the Chicago Athenaeum Museum of Architecture and Design, as well as several new pieces that were introduced in April at Milan's Salone del Mobile. Chicago Athenaeum. 312/251-0176.

**The Architecture of Graham, Anderson, Probst & White**
**Chicago**
*Through September 6*
On exhibit is the work of this venerable Chicago firm, a leader in the development of "commercial classicism." The projects on view, dating from 1912 to 1936, include such landmarks as the Merchandise Mart, the Civic Opera House, the Wrigley Building, and Chicago Union Station. Chicago Architecture Foundation. 312/922-3432.

**At the End of the Century: 100 Years of Architecture**
**Tokyo**
*Through September 6*
A major exhibition exploring the history of architecture and urbanism in the 20th century begins its international tour in Tokyo. Models, renderings, photographs, and multimedia components are on view. Museum of Contemporary Art. 011/81/03/5245-4111.

**Japan 2000: Design for the Japanese Public**
**Chicago**
*Through September 7*
An exhibition of recent winners of Japan's G-Mark, an annual government-sponsored awards program that promotes good design. Art Institute of Chicago. 312/443-3600.

**National Design Triennial**
**New York City**
*Through September 12*
A survey of developments in contemporary design, investigating how issues and ideas drive design practices in America. Cooper-Hewitt National Design Museum. 212/849-8300.

**The Art of Architecture and Architecture in Art**
**New Orleans**
*Through September 20*
An experiment in blurring the distinction between the aesthetics of architecture and the aesthetics of fine art, this exhibition features architects' work in various art media and artists' work that incorporates an architectural sensibility. Contemporary Arts Center. 504/523-1216.

**Tony Smith Retrospective**
**New York City**
*Through September 22*
Works by the architect and artist, who trained under Frank Lloyd Wright and designed houses before turning to painting and sculpture. Several of Smith's monumental sculptural works will be installed at public sites throughout Manhattan during the exhibition. Museum of Modern Art. 212/708-9400.

**Completing the Federal Triangle**
**Washington, D.C.**
*Through September 27*
An exhibition documenting the recently completed Ronald Reagan Building and International Trade Center in Washington, D.C., by Pei Cobb Freed & Partners in association with Ellerbe Becket. National Building Museum. 202/272-2448.

**Shifting Gears: In Pursuit of a Greener City**
**Toronto**
*Through September 27*
An exhibition proposing urban design strategies for reducing carbon dioxide emissions. Design Exchange. 416/216-2145.

**Fountains: Splash and Spectacle**
**New York City**
*Through October 11*
This exhibition elucidates the role of fountains—and water as a design force—in defining urban space in Europe and America, with examples ranging from the Renaissance to the present. Cooper-Hewitt National Design Museum. 212/849-8300.

**Frank Lloyd Wright and the Living City**
**Weil am Rhein, Germany**
*Through October 11*
An exhibition of Wright's schemes for Broadacre City, which attempted to erase the dichotomy between city and country. This is the most comprehensive exhibition in Europe of Wright's work to date. Vitra Design Museum. For more information, call 011/49/7621/702-33-51 or visit www.design-museum.de.

**Walker Evans: New York**
**Los Angeles**
*Through October 11*
While Evans is best known for his Depression-era photographs of the American South, this exhibition reveals the full range of his work as a New York street photographer, including some of his earliest and most abstract compositions. J. Paul Getty Museum. 310/440-7360

**Do Normal: Recent Dutch Design**
**San Francisco**
*Through October 20*
This exhibition of works by Dutch designers focuses on the centuries-old design consciousness that pervades every aspect of the country's culture. San Francisco Museum of Modern Art. 415/357-4000.

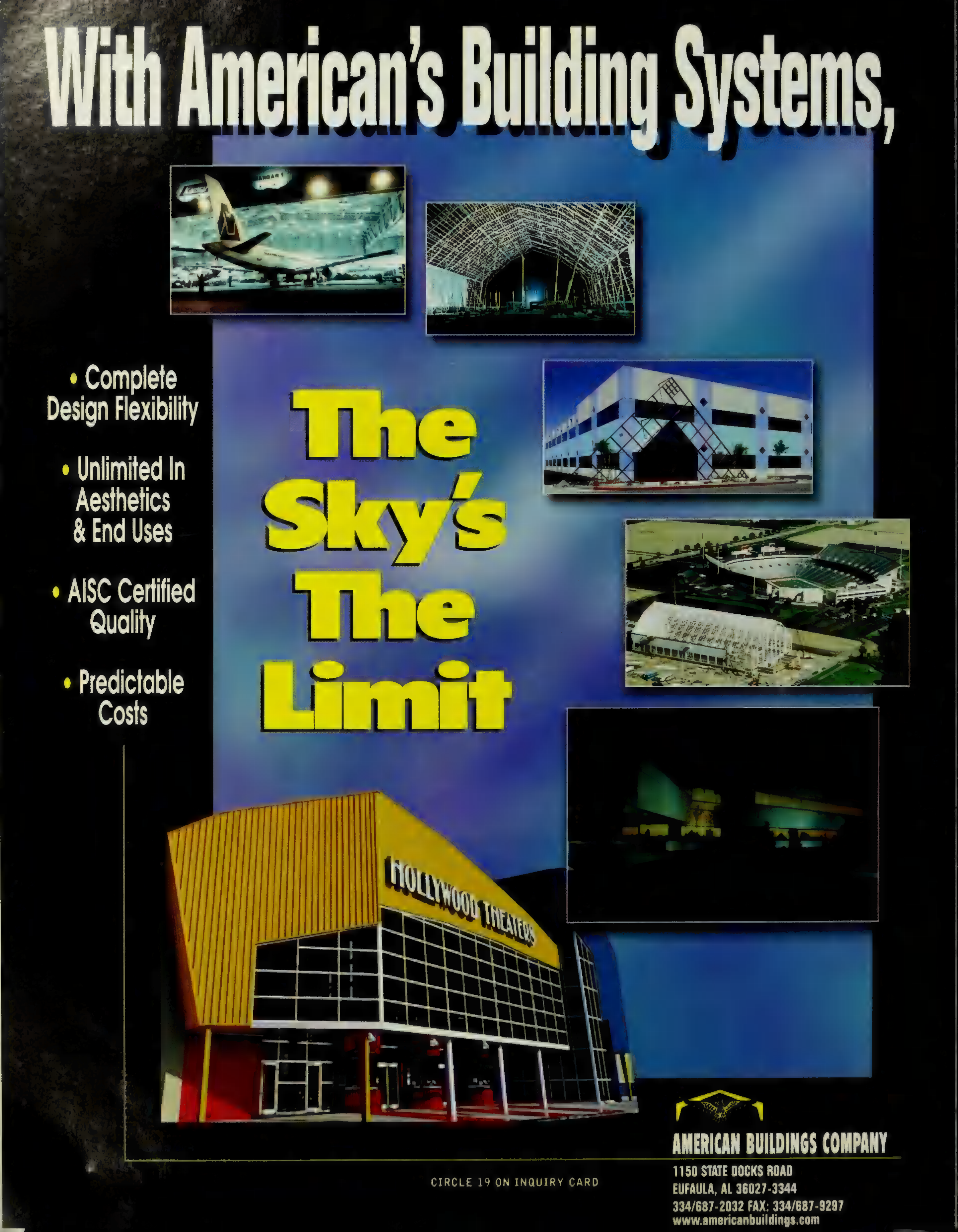
**Under the Sun: An Outdoor Exhibition of Light**
**New York City**
*Through October 25*
An exhibition of solar-powered installations, including commercial products, experimental prototypes, and commissioned designs. Cooper-Hewitt National Design Museum. 212/849-8300.

**New Ways of Revitalizing the American City**
**Washington, D.C.**
*Through January 3, 1999*
An exhibition illustrating how new cultural facilities have enlivened tired downtowns in Phoenix; Cincinnati; Fort Worth; Newark, New Jersey; San Jose, California; and Kansas City, Missouri. National Building Museum. 202/272-2448.

**Robert Adam: The Creative Mind**
**Washington, D.C.**
*Through January 3, 1999*
An exhibition of the work of the 18th-century Scottish architect, demonstrating the process of design from conception to final presentation. The Octagon. 202/638-3105.

**Bechtel's First Century**
**Washington, D.C.**
*Through January 4, 1999*
A portfolio of projects by the San Francisco–based Bechtel Group, one of the world's largest engineering and construction firms. Highlighted "megaprojects" include the

*(continued on page 195)*



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# WHEN IT CAME TO RENOVATING THIS HISTORIC COURTHOUSE, EVEN THE

In 1964, The Parker County Courthouse in Weatherford, Texas was designated a Texas Historic Landmark. And thus began the slow, methodical process of restoring it. First to receive attention was the structure's limestone stonework. Later, the roof was replaced. Then came the windows, which proved to be one of the most challenging aspects of the project.

The Historical Survey Committee mandates that if nothing remains of a historic building's original windows, the new ones must be faithful reproductions, right down to the last detai Since the courthouse's original wood windows had been replaced by aluminum ones some years back, that meant that all 105 of the new windows had to be virtually identical to those made and installed over a century ago.

Bids were sought, but only two manufacturers felt qualified to respond. One of them, Marvin Windows & Doors, had actually been recommended by a company that was asked to bid but declined.

Though underbid by the other finalist, Marvin's figures were based on building the largest windows with structural muntin bars to withstand the winds that buffeted the building's hilltop site. Intrigued, the architect asked each company to build a sample window. One look at the prototypes and the job was immediately awarded to Marvin.

For the next several weeks, Marvin's architectural department busied itself recreating the past. Working from turn-of-the-century photographs

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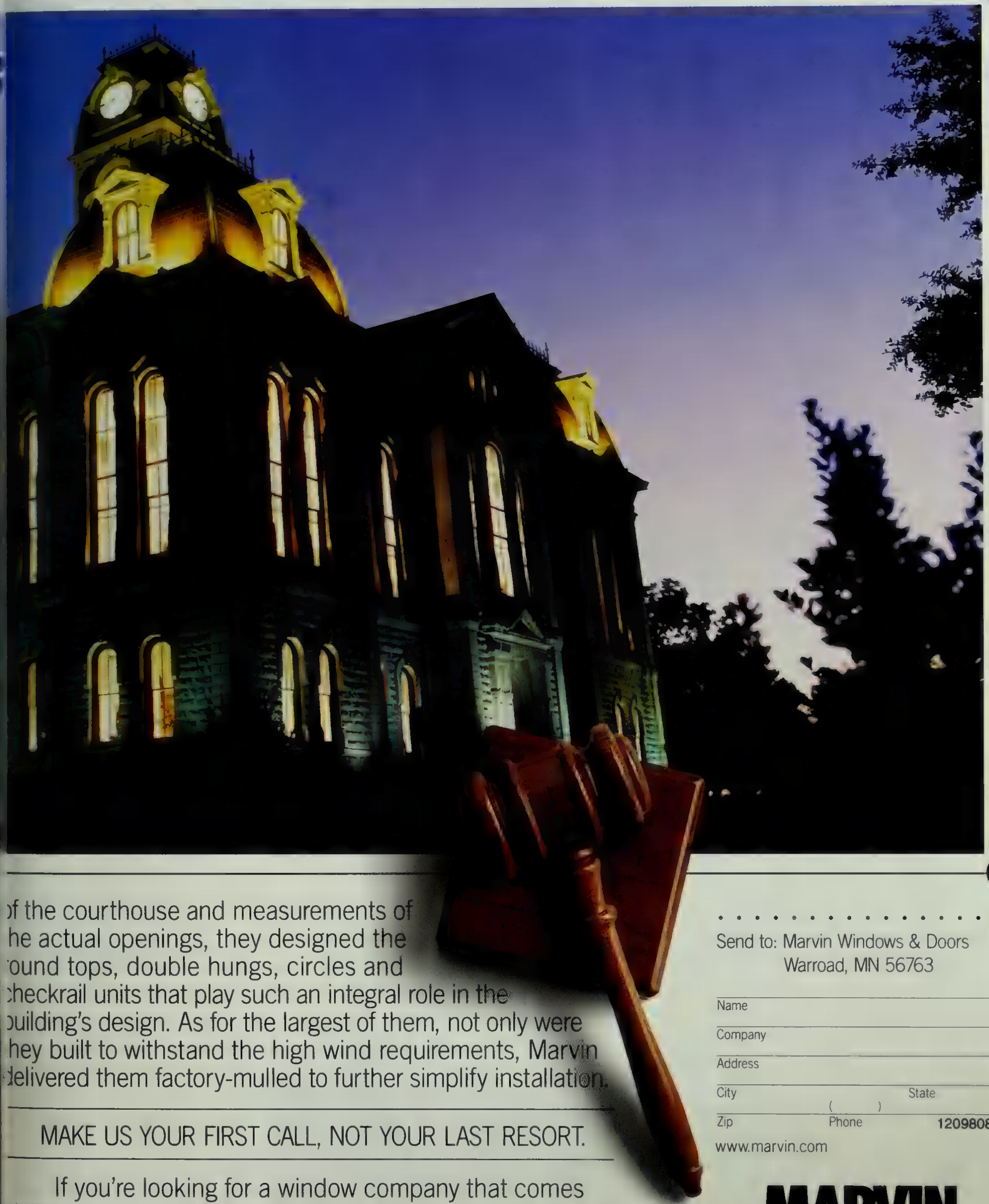

of the courthouse and measurements of he actual openings, they designed the round tops, double hungs, circles and checkrail units that play such an integral role in the building's design. As for the largest of them, not only were hey built to withstand the high wind requirements, Marvin delivered them factory-mulled to further simplify installation.

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## FLAWED DESIGN AND FALLING BRICKS DOOM AMSTERDAM SHOPPING MALL

It was supposed to breathe new life into a fairly derelict part of Amsterdam's historic center, but two years after the multiuse complex De Kolk opened its doors, the owner, ABN AMRO Project Ontwikkeling, admits that its centerpiece, a shopping mall, is a failure. The owner is buying out the leases of the few remaining retailers in the mall and readying plans for a far-reaching renovation.

From the start, the design challenge facing architect Ben van Berkel was formidable. The complex is located on an irregularly shaped sliver of land, traversed by narrow alleys and pedestrian streets and surrounded by typically undersized, crooked Dutch buildings dating back more than 300 years.

Van Berkel, perhaps best known for his daring design of Rotterdam's Erasmus Bridge, set large expanses of green glass and red brick at impossibly oblique angles to create a modern interpretation of 17th-century Dutch ambience. He was rewarded with a decidedly unenthusiastic response from critics—and that was before the bricks began falling off the facade.

Van Berkel has publicly defended his design (and denied responsibility for the falling bricks, which are now held in place by chicken wire), but the director of the local merchants' association says it was fatally flawed. "You had to look for an entrance," says Arthur van den Noord, adding that there was no interior link between the parking garage and the mall.

ABN AMRO is revealing little about what it hopes to salvage from the project, but departing shopkeepers suspect that the Hotel Inntel, also housed in the complex, will take over much of the vacated retail space. An ABN AMRO spokesman said only that no decision had been made. *Jim Wake*

## THE MUSEUM DESIGN DEBATE: IS THE BUILDING PART OF THE ART?

Are museums simply neutral structures in which art or artifacts are shown, or do they have a more active role in the viewer's experience?

A recent symposium at the National Building Museum in Washington, D.C., attempted to answer this question. The discussion—inspired by the recent publication of Victoria Newhouse's *Towards a New Museum*—was moderated by Suzanne Stephens, and participants included Newhouse; Daniel Libeskind, architect of the Jewish Museum in Berlin; Ralph Applebaum, designer of the permanent installations at Washington's Holocaust Memorial Museum; and J. Carter Brown, director emeritus of the National Gallery of Art.

Newhouse's introduction, tracing the relationship between "the aesthetic experience of art, versus the didactic intention of exhibitions," formed the basis for the ensuing discussion. Brown favored a subdued approach for gallery design. Despite the grand atrium of the National Gallery's East Wing or the flamboyant forms of the Guggenheim in Bilbao, the galleries within provide intimate spaces for viewing art, he said. "Architecture must be supportive, and the aesthetic experience of the art is primary."

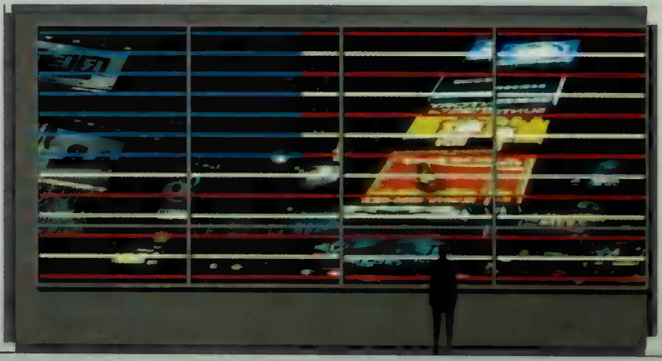
Applebaum and Libeskind, on the other hand, advocated a more theatrical approach, with Applebaum explaining that the architecture "acts as a mediator between the viewer and the viewed," becoming a "storyteller." The towers of the Holocaust Museum, for instance, are evocative of the concentration camp guard towers. Even the location of air-conditioning vents, Applebaum said, is intended to reinforce the mood and foster the viewer's empathy.

Libeskind noted that the fenestration of the Jewish Museum, which resembles slashes in the building face, is a metaphor for the scars inflicted on Berlin. The building, he noted, "is a very particular view of content, form, and urban space."

The symposium came at a timely moment, as attendance at museums has been soaring and construction of new museums is booming. Whatever the cause, the interest makes for what Applebaum calls "a new way for people to engage in civic life." *Ellen Sands*

**POLISHING THE APPLE** **A trio of Manhattan's most recognizable locations will soon be getting new looks. Radio City Music Hall is set to undergo the most extensive renovation in its 65-year history, a $30 million makeover that will close the theater for at least six months. Plans call for a meticulous restoration of the live-theater facilities, as well as the creation of a production center for television specials and the like. Work is scheduled to begin in March, with two New York City firms—Hardy Holzman Pfeiffer Associates and the Rockwell Group—overseeing the renewal.**

**A few blocks south of Radio City, the U.S. Armed Forces Recruiting Center—a small but steady presence in Times Square since 1946—is being redone this fall by New York's Architecture Research Office. The 520-square-foot structure will have new exterior glass facades resembling American flags (right), while the reorganized interior will include an important addition: a restroom.**



**Meanwhile, plans to build a new concourse for Pennsylvania Station within the landmark General Post Office on Eighth Avenue took a major step forward when state officials decided to negotiate with only one firm: Skidmore, Owings & Merrill. An initial plan could be unveiled by the end of the summer.** ***Soren Larson***

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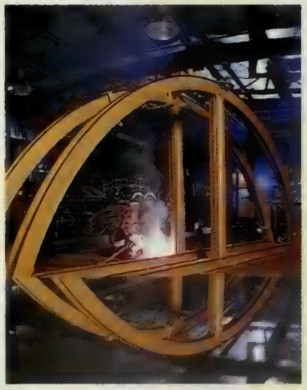

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CIRCLE 22 ON INQUIRY CARD

# PEI COMMUNES WITH NATURE AT JAPAN'S REMOTE MIHO MUSEUM

Though I. M. Pei, FAIA, has all but retired from Pei Cobb Freed & Partners, he has not retired from the practice of architecture. "Now I have the luxury of choosing clients and more philosophical challenges," he says.

The Miho Museum, outside Kyoto, Japan, is the project that has most occupied Pei these last few years. And the clients—Mihoko Koyama and her daughter, Hiroko Koyama—must count among the more remarkable ones Pei has worked with in a rich career. Not only are they patrons in the traditional sense, they are the leaders of a 350,000-person spiritual association, Shinji Shumeikai, for which the appreciation of art, beauty, and the natural world is key to well-being.

On the remote, mountainous, often mist-shrouded site where the museum was to be built, Pei's charge was not only to house the Koyamas' art collection, but also to create a space that would represent the civilizing and spiritually enhancing capacity of art.

Pei had first joined with the Koyamas on a much smaller project. Shinji Shumeikai completed a 3,000-seat sanctuary by Minoru Yamasaki (of World Trade Center fame) in 1982, but by the time the group decided to add a bell tower, Yamasaki had died. Pei was then asked to take on the design—and the situation soon blossomed into talk of a museum. Hiroko Koyama says Pei prodded her with the query, "Only a bell tower?" He completed the tower in 1990 and then turned his attentions to housing the family's art, which mainly consisted of objects for the Japanese tea ceremony. At Pei's suggestion, the family doubled the size of the collection, giving it a more international scope.

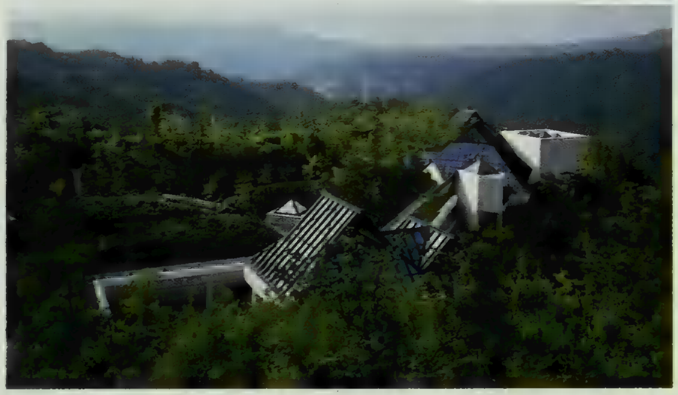
However, many challenges arose. The site, in an area preserved in its natural state, was subject to stringent requirements. The building could not rise higher than 40 feet, and less than 20,000 square feet of roof could be visible. Environmental rules severely limited road building.

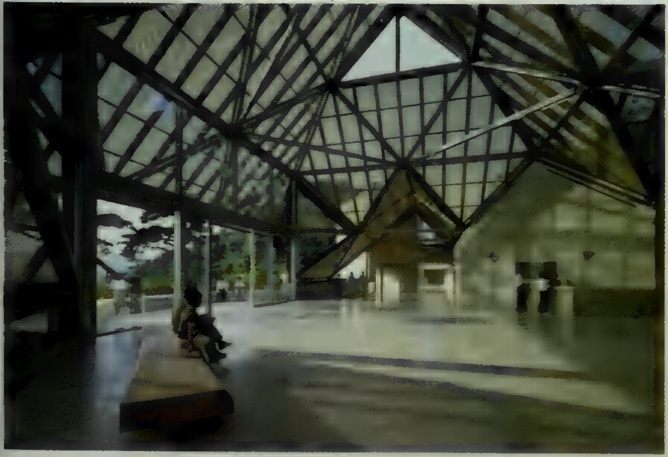
Since the collection included national treasures, extremely conservative display and conservation criteria also applied. For instance, the art could not be moved into the building until two monsoon seasons had passed after concrete pouring. Pei met each demand. Most of the building is underground, with its bearing walls and earth-retaining walls constructed separately so that the monsoon requirement would not delay the opening. Pei's associate in Japan, Tim Culbert, designed vitrines with fiber-optic lighting (which puts less heat on the objects) and hands-free retracting devices so art can be moved as safely as possible.

The Koyamas agreed to the considerable cost of a pedestrian tunnel and bridge (an elegant structure by engineer Leslie Robertson of New York City) to shift the roads and parking lots to a less sensitive area. Visitors proceed on foot from a semicircular entrance pavilion through the quarter-mile-long tunnel, then across a ravine on Robertson's bridge before reaching the formal, symmetrical entry. This leads to a glass roof triangulated with the architect's characteristic tubular-metal supports and shaded by internal extruded-metal slats painted to look like wood. Two long corridors lead to the galleries.

The building has the unmistakable Pei touch, but without his usually tight geometry. The glass roofs—the primary forms visible from the exterior—evoke traditional Japanese vernacular and temple forms. As Pei explains in a recent film made about the project, "the silhouette is Japanese, yet the materials are of our time."

*James S. Russell, AIA*





### INTERVIEW: I.M. PEI, STILL GOING

**RECORD: You are well past the age when most people retire [Pei is 81]. What keeps you going?**

**Pei: I am now able to concentrate on what I enjoy doing. I wanted to be able to give the time and thought that certain projects deserve.**

**RECORD: Why did you take the Miho project?**

**Pei: I found the Koyamas to be people of great quality, intelligence, and spirituality. Both have a strong feeling for nature. I saw the site and said this is where I want to work.**

**RECORD: But most of your projects have such a strong urban dimension.**

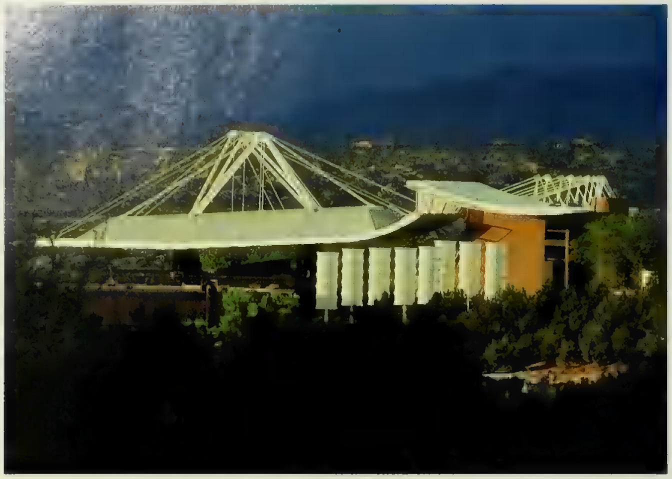
**Pei: That's why I liked this one. I came from [the Chinese region of] Suchow, which is famous for its gardens. I wanted to do more work which involved landscape. In urban work, geometry is primary. But nature is different. When possible, geometry has to be there to give discipline, but it can bend, say, to save trees.**

**RECORD: You are now working in Europe. What makes projects there compelling?**

**Pei: I look for projects that are public, that have a political or social purpose. It is why I accepted [a project] in former East Berlin on the Museum Island. Chancellor Kohl wanted an exhibition space that dispels German militarism from Bismarck to Hitler. I don't do competitions, but I was attracted to one in Luxembourg because the site is on top of a fortress that I thought had been done by Vauban. He is the architect of Carcassonne—probably the most important architect of military science. It turns out the fortress is Austrian, built on foundations of one designed by Vauban. Still, I took the job because we're dealing with nature and archaeology. How do you build on top of this?**

**RECORD: What would you like to do?**

**Pei: I'm still searching for another challenge to work in nature.** ***J.S.R.***



## NO MORE RAINOUTS IN SANTA FE AS OPERA HOUSE GETS A NEW ROOF

Opera lovers have long flocked to the foothills of the Sangre de Cristo Mountains in the summer to enjoy Mozart and Verdi performed at Santa Fe's famous open-air theater. Built in 1968, the partially enclosed opera house was renowned for its stunning view of the desert skies. The only problem: a gap in the roof left some patrons running for cover during the occasional rainstorm. "We used to sell cheap rain parkas in the gift shop," says Susan Switzer, director of public relations for the Santa Fe Opera.

This summer, thanks to a $19.5 million renovation by Polshek and Partners Architects, Santa Fe operagoers no longer need to wear plastic over their tuxedos and evening gowns. The New York firm, known for its restoration and renovation of Carnegie Hall, designed a cable-suspended double roof, with the two parts now overlapping; an 11-foot clerestory window was installed in the space between the halves. James Polshek, FAIA, says the new structure was inspired by "nomadic architecture built by Native Americans and others."

The firm also increased the capacity by 237 seats (to 2,166), replaced the old Plexiglas seats with upholstered ones, brought the theater into compliance with the Americans with Disabilities Act, and restored a small reflecting pool located close to the orchestra pit.

Reaction to the renovated opera hall, which reopened last month, has been mostly positive, says founder and director John Crosby. Still, the design hasn't completely solved the weather problem: the sides are still open to the elements. Polshek added wind deflectors, but rain can still blow in, as it did in one recent performance. However, the last thing patrons wanted was an enclosed structure. "You can't have an open-air theater that is completely impervious to the elements," Crosby says. *David Hill*

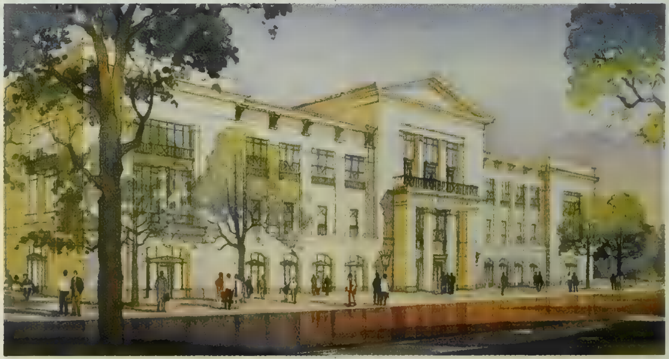
## STERN'S NEW NASHVILLE LIBRARY IS A NOD TO LOCAL CLASSICISM

Nashville will soon have a new public library that echoes the classical architecture of its most prominent public buildings. The design, by New York's Robert A.M. Stern Architects, features a neoclassical exterior and a clear, functional organization of the most significant public areas.

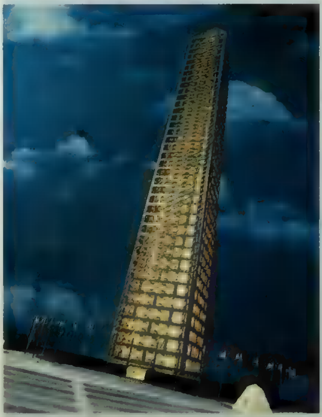
Nashville's classical tradition extends from the State Capitol and War Memorial in the downtown area to many of the city's neighborhoods. The library competition jury didn't want to break from this tradition; Stern was the obvious choice. The jury commended the firm's design for providing "a variety of public spaces, each with a distinct but interrelated character. The layout is well thought out and there is easy orientation within the building." While Stern is the design architect, Hart Freeland Roberts will serve as consultant and be responsible for the working drawings.

The main facade of the 290,000-square-foot library will be constructed of cast stone, with a main entrance framed by Ionic columns. The major public areas—including a large reading room, a local history collection, and a garden courtyard—are situated on the axis of the Capitol, which the architects believe will strengthen the civic center complex as a whole.

The project is part of a $110.7 million library program in Nashville that includes five new branches and renovations to existing libraries. Construction of Stern's main branch will begin next year. *S.L.*



**A MONUMENTAL RENOVATION** **Even a symbol of endurance like the Washington Monument can use a little work now and then. The building has long been in need of a new HVAC system and elevator, while the stonework needs cleaning and repointing. Help first appeared a year ago when Target Stores and the National Park Foundation announced they had teamed up to finance and tackle the project; soon thereafter, Michael Graves was called on to design the scaffolding. Graves later explained that he wanted to provide something that would be beautiful in its own right, and perhaps also educate visitors about the traditions of obelisks and monuments.**



**The interior work has now been completed, and the renovators are ready to begin on the exterior. Soon to be in place is Graves's aluminum-tube scaffolding, which, he says, "represents the bond pattern of the monument at an abstracted scale." At night, thanks to a contribution from General Electric, the project will be lit by hundreds of lights affixed to Graves's structure, with a glow produced by netting inside the scaffolding. The effect, according to the architect, should be "surreal."**

**Target has led the way among corporate sponsors, raising $5 million to assist the Park Foundation. The company recently upped the ante, pledging an additional $1.5 million to renovate the 500-foot-high observation platform inside the monument. Graves has been retained for that project as well. The entire effort should be completed sometime in 2000.** ***E.S.***

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## FOREIGN PRESS ROUNDUP

### VOX POPULI

The May/June issue of *Architecture Australia,* quoting the *Sydney Morning News*, reports that the practice of architect Dino Burratini has collapsed. Burratini designed the apartment complex at East Circular Quay that, when erected last year to great protest, blocked views of Sydney's cherished Opera House. Due to a sharp decline in commissions that the architect attributes to his recent notoriety, his staff has been pared from 68 to 3.

### IN SUPPORT OF SKATING

Iain Borden writes in the May issue of *Archis* (Rotterdam) that by subjecting skateboarders to curfews, harassment, and outright bans, we are suppressing what may be one of the few nonconformist gestures left in the urban sphere. Skateboarding, he says, "undertakes a release of energy that either creates or modifies space, espousing play, art and festival." Meanwhile, the June issue of *Techniques & Architecture* (Paris) features new skateboarding facilities in France, bubbling that "[street sports] never cease to reinvent the physical use of the town."

### ASIA'S RETAIL RESILIENCE

To prove that the downturn in the Asian economy hasn't brought retail construction in Hong Kong to a halt, local magazine *Hinge* profiled more than a dozen recently completed high-end retail projects. According to one consultant, "Changes can be made now to avoid disrupting or closing stores for refurbishment when the market is busy. . . . It also gives a positive impression to the people on the street that the company is still a solid, growing business."

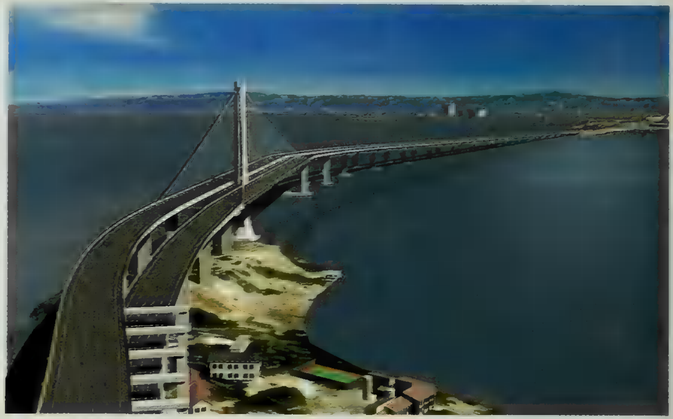
### LOOTED TREASURES

The purchase of Mexican architect Luis Barragán's professional archive, including copyrighted images, by the Vitra Museum in Germany has riled many of the architect's admirers in Mexico. In an editorial excerpted from *La Jornada* in the summer issue of *Arquine* (Mexico City), Fernando González Gortázar writes, "Vitra has hindered the dissemination of what he was and what the master did, inhibited studies of his work, and even tried to exercise rights over . . . his personal archive and his library, which are in the possession of the Fundación de Arquitectura Tapatía in Guadalajara. It is here where we begin to have a feeling of looting, to feel something is being snatched, that we cannot tolerate."

### SLAMMING A METABOLIST

In a review of an exhibition of Kisho Kurokawa's work at the Royal Institute of British Architects that appeared in the April edition of RIBA's own *Journal,* Peter Popham rips into the Japanese architect's reputation, calling him "an architect of vast ambition and very modest gifts, who has been taking the world for a ride for the best part of 40 years." Once enamored of the famous Metabolist, having been hypnotized by his talk of Zen and a "culture of greys," Popham "started noticing how incredibly clunky and clumsy his designs were. Daido Insurance Building in Tokyo, Aoyama Bell Commons, Seibu Big Box—these were heavy, graceless, commercial hulks. Even Nakagin [Capsule Tower, an iconic work of the Metabolist school], though arresting, was formally crude."

*—compiled by David Simon Morton*



## SUSPENSION DESIGN IS APPROVED FOR REPLACEMENT OF BAY BRIDGE SPAN

Nearly nine years after shocking images of a car crashing on the earthquake-damaged San Francisco–Oakland Bay Bridge flashed across the nation's television screens, California transportation officials have selected a design to replace the bridge's weakened East Span. The new span, a single-tower self-anchored suspension design, will be the first major suspension bridge built in America since the 1960s.

The Metropolitan Transportation Commission (MTC), the region's planning agency, made the decision at a June hearing in Oakland, although the California Department of Transportation (Caltrans), which is overseeing the design, had already proposed replacing the 62-year-old East Span, which connects Yerba Buena Island and Oakland, with a mile-and-a-half-long elevated viaduct. Instead, the MTC's Engineering Design Advisory Panel (EDAP) pushed for consideration of a more memorable "signature span," featuring either a cable-stayed or suspension design.

Caltrans' consulting engineers, San Francisco–based T. Y. Lin International and Moffatt and Nichol Engineering, then developed two schemes through an internal competition: San Francisco's Donald McDonald Architects and Weidlinger Associates of New York consulted on the design of a suspension scheme, while H2L2 Architects of Philadelphia developed a cable-stayed option with T. Y. Lin.

Although engineers favor cable-stayed bridges for their efficiency and ease of construction, EDAP deemed the suspension option (above) more compatible with the West Span and the other catenary-shaped structures around the Bay. T. Y. Lin project manager Rafael Manzanerez felt the decision came down to whether "the people here want a new form in the bay, or a form they're familiar with."

At 1,263 feet, the new span will be the longest self-anchoring suspension bridge in the world and will boast a final pricetag of an estimated $1.5 billion. Construction cost will be funded by state bonds, a gas tax increase, and bridge tolls.

The MTC's 18-month selection process generated an extraordinary amount of public discussion—and it hasn't subsided. Caltrans has encountered an 11th-hour challenge by San Francisco Mayor Willie Brown, who fears the new bridge will interfere with his plans to redevelop Treasure Island, and Oakland mayor-elect Jerry Brown, who objects on aesthetic grounds. The latter Brown has been joined in his demand for an international design competition by longtime Bay Area architecture critic Alan Temko.

Nevertheless, design work continues and construction should start in 1999, Caltrans says, with an opening in 2003. *Eric C.Y. Fang*

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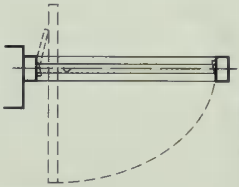

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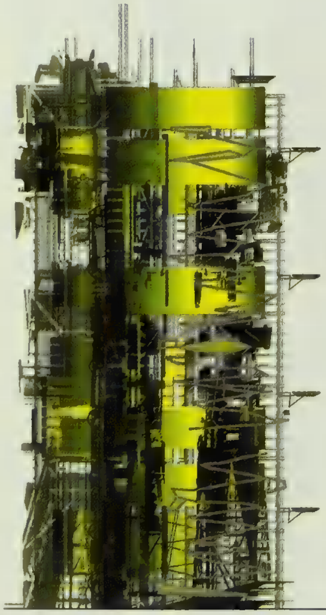
## A LOFTY IDEA FOR EXPO FACILITIES: THE WORLD'S TALLEST TOWER

When Japan hosts a world's fair in 2005, the festivities will be centered in an undeveloped, mostly forested area near Seto City. The organizers are considering clearing a space for a traditional, horizontal Expo grounds, but that won't happen if Ken Yeang can help it.

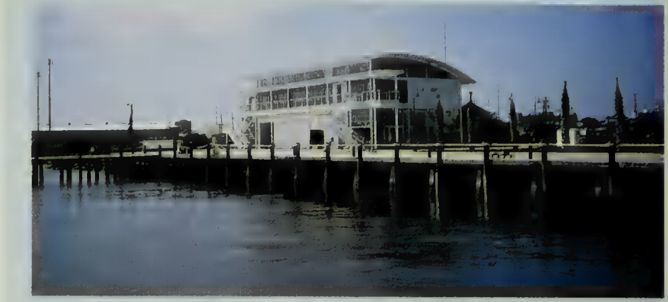
Yeang, a Malaysian architect, has a very different idea: he envisions the world's tallest building, a 150-floor skyscraper that rises 1,968 feet above the forest floor (top of the scheme shown below) and fits all the Expo activities under one roof. It is estimated that the total cost of the project—designed by Yeang's firm, T. R. Hamzah & Yeang, in conjunction with project leader Kiyonori Kikutake and Shizuo Harada—would approach $1.4 billion.



Environmental concerns are part of Yeang's concept; he finds it ironic that an event whose theme is "Rediscovering Nature's Wisdom" would likely develop some 350 acres for horizontal facilities. A single tower, he reasons, would cause less damage to the immediate environment and occupy a footprint of slightly over seven acres.

Yeang also proposes solutions to the logistical problems that would stem from holding such an event in a single tower. Transportation, housing, and mechanical functions for the international displays all had to be considered. Among the more striking proposals is a dual-track, monorail train system that would spiral around the exterior wall, taking visitors up or down to their desired locations in a rather breathtaking fashion.

The tower would also take advantage of environmental technologies such as solar heating and natural ventilation. And it wouldn't be unoccupied after the Expo has gone—it could be redeveloped to include housing, shops, offices, and factories. Whether to go horizontal or vertical is in the hands of the Exposition Committee, which is now mulling its options. *S.L.*



**CHARLESTON'S MARITIME JUXTAPOSITION** In the midst of its historic district, Charleston, South Carolina, has constructed a Maritime Center with a contemporary look. The architects, Sasaki Associates of Watertown, Massachusetts, have designed several other Charleston projects, but their prior efforts have had a traditional look, as required by the City's Board of Architectural Review. This time, Sasaki (with Larry R. Young as principal-in-charge) successfully argued that the forms, uses, and materials of nearby structures indicated the most contextually appropriate building would have a Modernist design.

The immediate context was clearly nautical, but two other factors came into play. First, the many metal warehouse and industrial buildings nearby determined the choice of steel frame, metal wall panels, and metal roof. A second, if less obvious, inspiration came from a traditional form that has been built in all eras and parts of Charleston, going back to the 1730s: the "single house," a narrow, one-room-wide building with windows on both sides, high ceilings, and a broad covered porch, known locally as a "piazza."

The 7,400-square-foot Maritime Center serves both industry and recreation. The ground floor is devoted to fishing-related uses; its main space is a large workroom for fish packing and sorting. Overhead industrial doors open the entire east and west walls to allow full access to fishermen from the waterside and refrigerated trucks on the land side.

A retail space for selling fish is located at the north end of the building, while the second floor contains a gift shop, multipurpose community space/conference center, and marina offices.

In addition to the building, the center includes two new piers—one commercial and one recreational—as well as a one-acre waterfront park. The new facility allows Charleston to host a variety of maritime events ranging from fishing tournaments to tall ship tours. *Jonathan Hale*

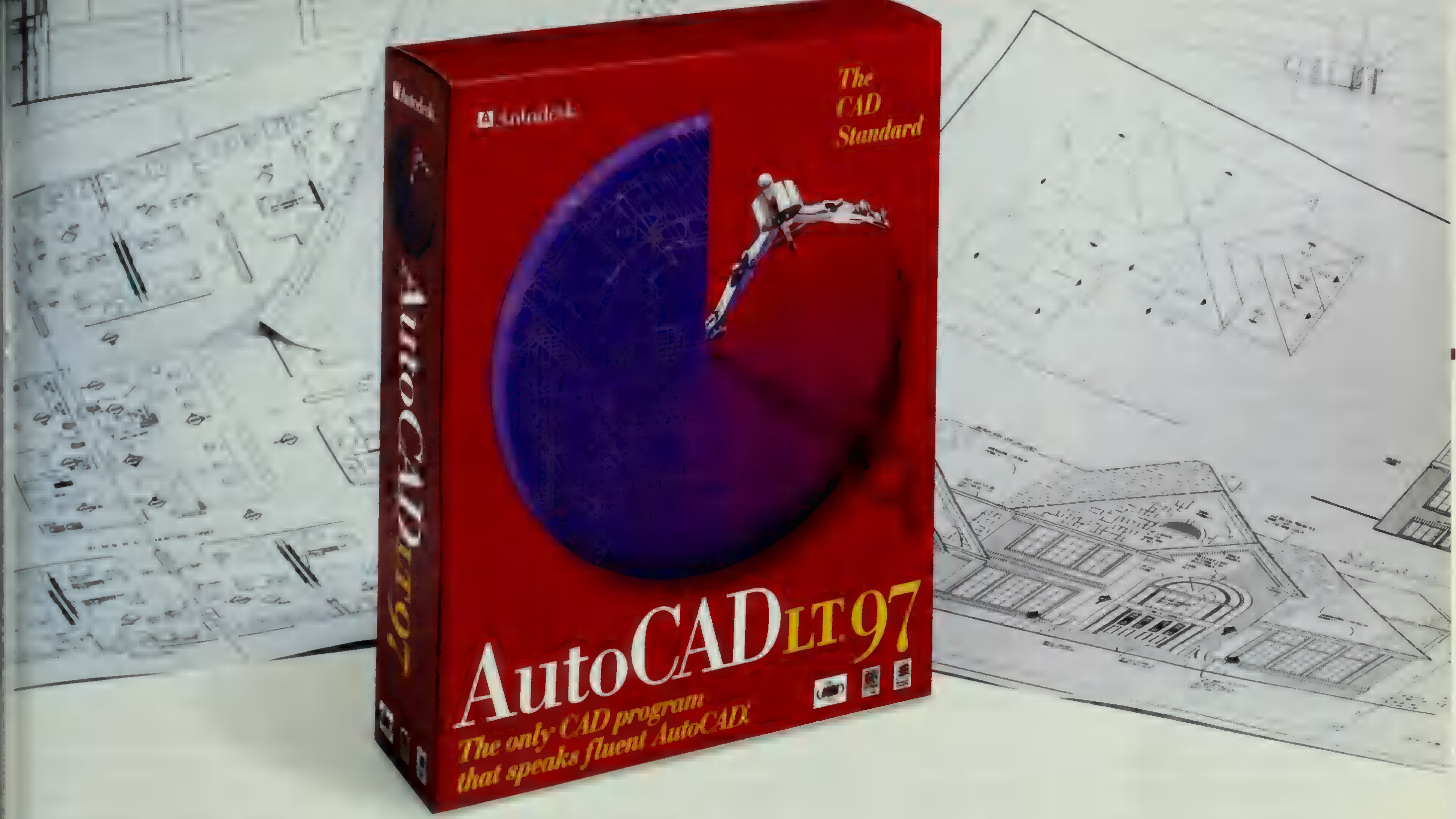
## NCARB'S LATEST RESOLUTIONS DIFFER FROM AIA BOARD'S VOTE

When the National Council of Architectural Registration Boards met in San Diego in June, delegates passed two resolutions that could affect architectural practice, one dealing with liability, the other with licensing. In doing so, they broke with the AIA's board of directors, which recently voted down similar measures.

First, NCARB's new model rule of conduct protects everyone who works in architecture firms by upholding fair labor standards and antidiscrimination laws. NCARB and its member boards aren't obligated to police conduct, but they wanted to send the message that it is unethical to have interns work for little or no pay. If a state board finds a firm in violation, it may refer the case to NCARB's professional conduct committee—which might revoke the certification of all principals of a firm found guilty of unfair labor practices.

The AIA board concurs that interns should be fairly compensated, according to an AIA spokeswoman, but rejected this rule because it makes all of a firm's principals liable for the actions of, perhaps, one principal or a few.

Some confusing wording in the second resolution may account for its rejection by the AIA. The amendment is intended to close a loophole in the model law for architectural licensing that NCARB promotes among state legislatures. AIA board members reportedly interpreted it as broadening the scope of work an unregistered architect may undertake. In fact, NCARB officials said, the amendment tightens controls on unregistered architects, who may provide design services if a building permit is not required and if structural and other life safety features are of no concern. The model law previously addressed only alterations and renovations, but the controls now extend to "any construction." *Ann Jarmusch*



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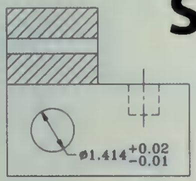

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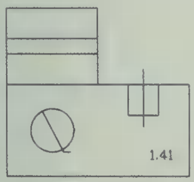

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## NEWS BRIEFS

**Presidential approval** The Pritzker Prize, the architecture world's most prestigious award, got some presidential attention in June when the Clintons hosted a ceremony in the White House to honor this year's recipient, Renzo Piano. In front of a gathering of the field's luminaries, including I. M. Pei, Frank Gehry, and last year's winner, Sverre Fehn, Bill Clinton spoke of how "all politicians have tried to convince people they were architects. If you listen to them speak long enough, you would be convinced that we were all born in log houses that we built ourselves."

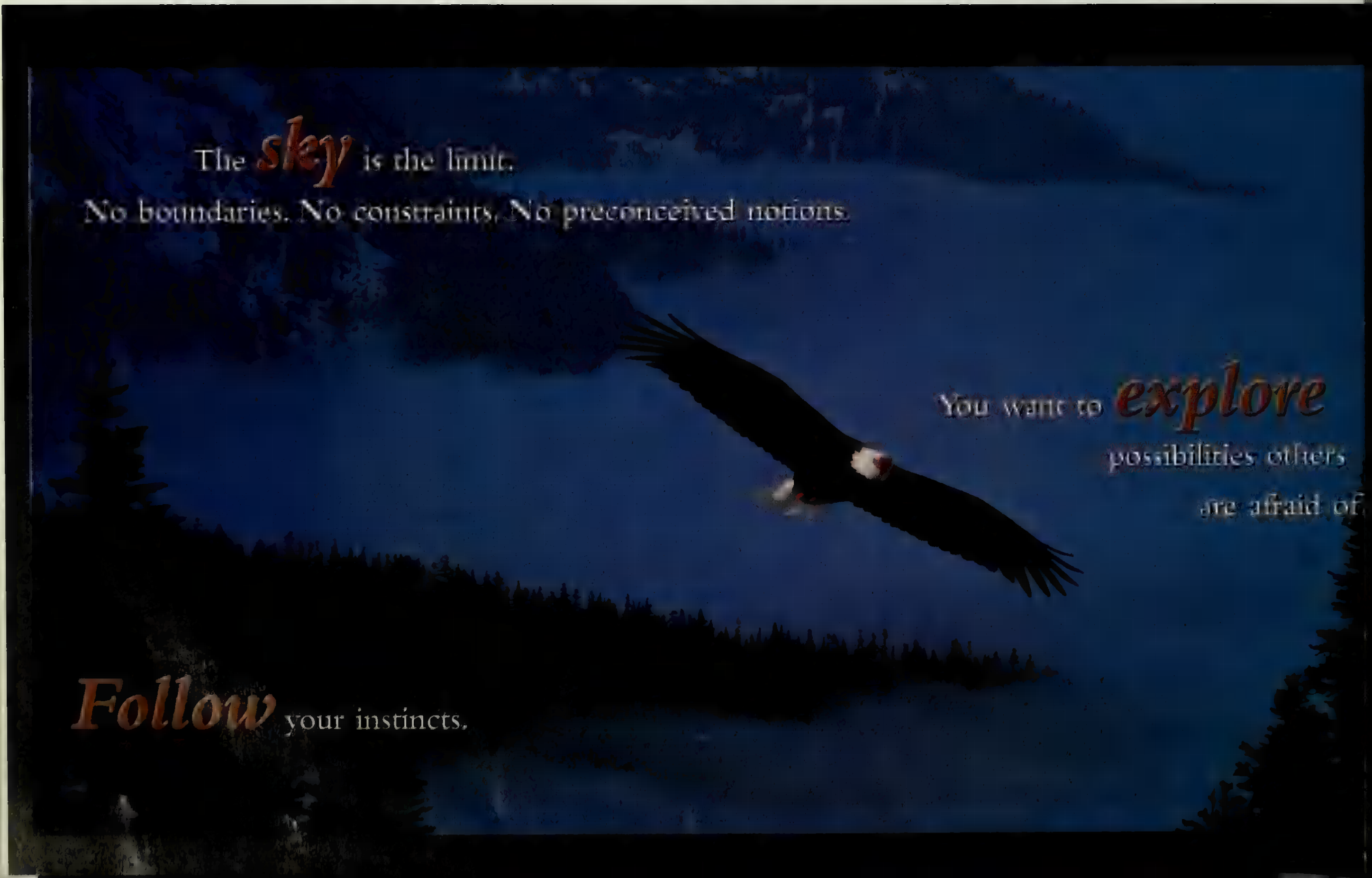
**Hillary on tour** Hillary Clinton didn't stop with the Pritzker dinner. Last month, she took a history tour and launched a preservation pledge drive, visiting George Washington's headquarters in Newburgh, New York, as well as a dilapidated theater, an Indian archaeological site, Thomas Edison's laboratory, and landmarks devoted to women's rights and African-American history. The sites included federal, state, and privately financed landmarks, all with expensive wish lists; the National Park Service alone has a $1 billion backlog in historic structure repair. The President's budget request of $50 million for the preservation program has yet to be approved by Congress.

**The first couple with Cindy and Jay Pritzker and Emilia and Renzo Piano.**

**Libeskind's first** While much has been made of Daniel Libeskind's first major commission, the design of the Jewish Museum in Berlin, the Felix Nussbaum Building in Osnabruck, Germany, turned out to be his first completed building. The museum, which houses work by Nussbaum, a 20th-century artist, opened late last month. The design uses a system of interrelated lines to symbolize Nussbaum's restlessness and search for orientation.

**Seoul music** ID8, the entertainment design studio of RTKL Associates, has completed its design for CoEx Plaza, a huge 1.02 million-square-foot underground entertainment center that will link directly to the Korean World Trade Center in Seoul. The concept is akin to a flowing river, according to the firm, and encompasses a cineplex, an aquarium, indoor golf, themed restaurants, and a mix of retailers, with subway stops at each end. Completion is slated for January 2000.

**Concrete solutions** Students from the University of Alabama–Huntsville triumphed at this year's American Society of Civil Engineers and Master Builders national concrete canoe competition. Along with winning a race, the team had to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possibilities others
are afraid of
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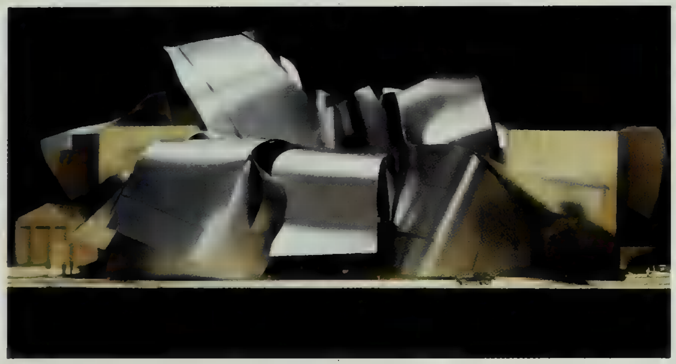
make written and oral presentations of its concrete canoe's design, and had to pass a test in which a submerged canoe pops up and floats.

**The Cartier's troubles** Last December French papers reported an evacuation of the Fondation Cartier in Paris, the four-year-old transparent glass building designed by Jean Nouvel. In March, it was announced that structural experts, called in by the building's owner, confirmed a "danger of collapse" in high winds. Nouvel denied a problem, but a secretive plan to reinforce the glass skin was then undertaken. Today, the building and its galleries have reopened, after much embarrassing press for Nouvel and aggravation for Cartier.



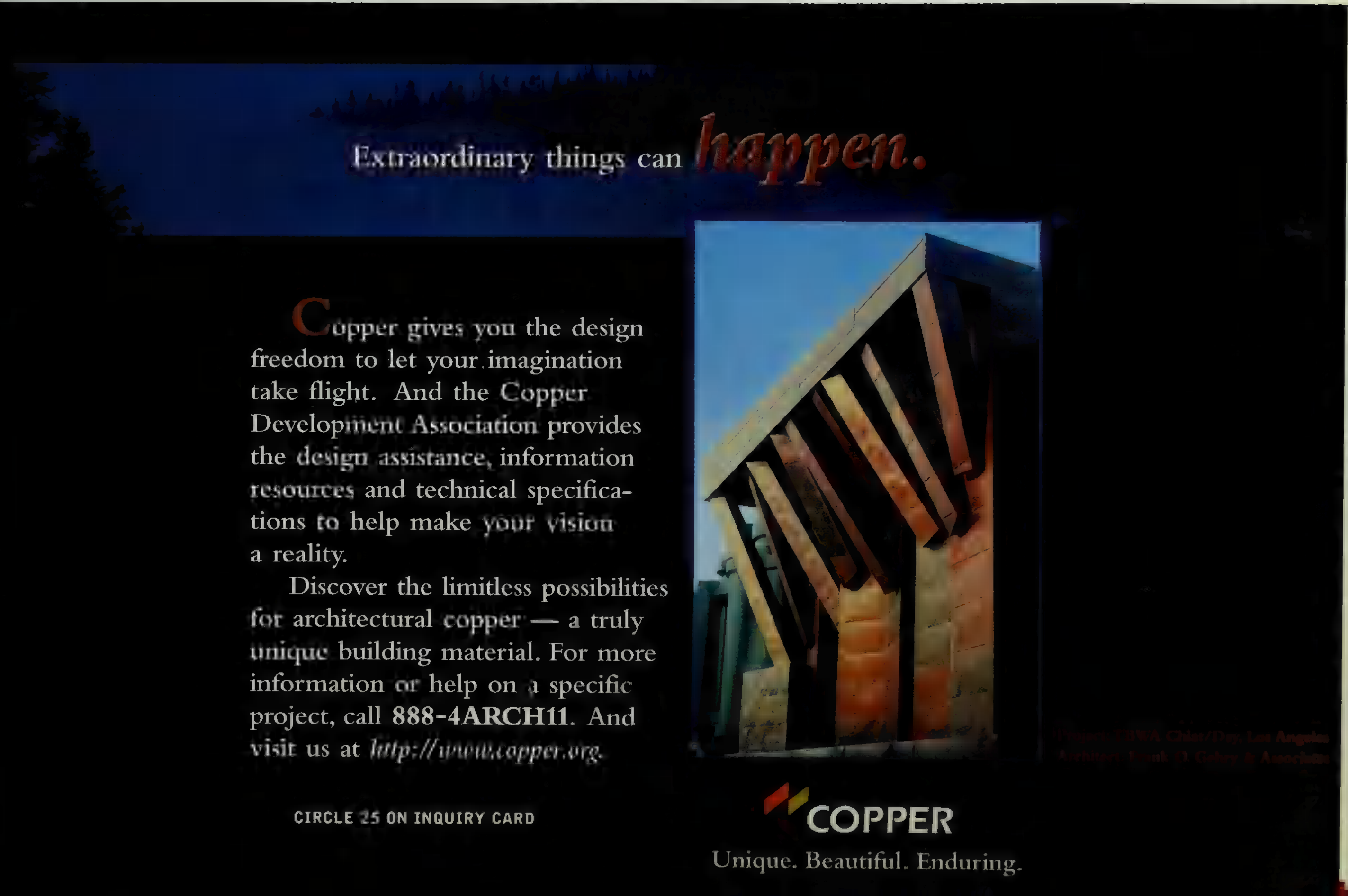
**Gehry's Case Western design.**

**Gehry goes again** Gleaming ribbons of metal, undulating solids, soaring atriums . . . the Guggenheim Bilbao? No, Frank Gehry's new home for the Weatherhead School of Management at Case Western Reserve University in Cleveland. The $33 million, 143,000-square-foot school is a multistory structure consisting of two curved, connected red-brick units topped by the flowing patterns of shining metal. The waterfall-like forms wrap around two towers that contain lofty atriums. Construction is expected to begin next spring.

**Relief effort** The Sho-Hondo, a monumental temple that sits at the foot of Mount Fuji, has been ordered destroyed by the chief priest of the resident Buddhist sect (who was apparently a rival of the priest who had it built). As a result, a wide-ranging group of architects and preservationists around the world has established the International Committee to Save the Sho-Hondo. The Sho-Hondo is "one of the finest representatives of postwar architecture in Japan," according to ICSS chairman David Anthone. The building, constructed in 1972 for around $100 million, features a suspension roof designed to symbolize a crane in flight and a fountain plaza that can accommodate 60,000 people.

**Designer ties** Civitas, a two-year-old company founded by two architects, is paying homage to urban design through fashion. The firm has created a line of ties printed with roadmaps of such cities as Rome, London, and New York, with scarves to come later.

**Koolhaas's next act** Rem Koolhaas is headed for Times Square. The Dutch architect, in association with New York–based Richard Gluckman, is designing a new theater for the Second Stage troupe. The 299-seat house is slated to open next February in what had been a bank building. The architects incorporated the existing structure in several ways: 20-foot-high windows will run behind the stage to create a real Manhattan setting, while the vault is being reused as a box office. ■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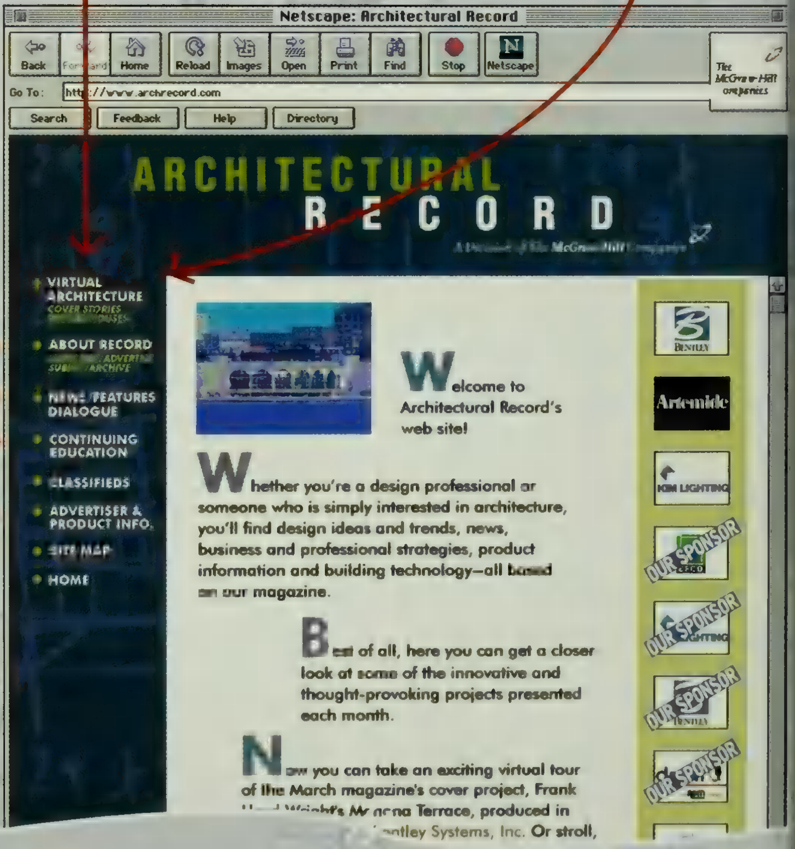

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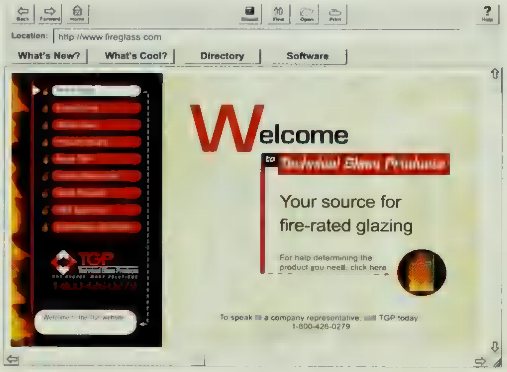

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Unfortunately, such is not the case. Recent news reports have shown that thousands of faulty sprinkler systems were installed nationwide. Even at their best, sprinkler systems are only as reliable as the maintenance they receive.

**"Sprinklers keep glass cool."**
Laboratory tests have shown that the effectiveness depends a great deal on where the fire is in relationship to the glass, as well as how quickly the sprinklers are activated. Since no one can predict where and when a fire will strike, relying exclusively on sprinklers to cool the glass may be unsafe.

**"Tenants will abide by guidelines for sprinklers."**
Some sprinkler manufacturers have restrictions on where blinds and curtains may be placed in relationship to windows for the sprinklers to work properly. But there is no guarantee future tenants will be aware of the restrictions and will heed them in their window treatments.

**"As long as I have sprinklers,
I can use any type of fire-rated glass."**
Not all fire-rated glass is equal. Some (such as products rated for only 20 minutes) do not pass the "hose stream" test. When heated by a fire, those products cannot withstand the thermal stress of even a small amount of cool water. Sprinklers could cause them to fall out of the opening, breaching the barrier to smoke and flames.

**"Sprinklers mean I don't need fire-rated glass."**
While sprinkler systems have proven effective as life safety devices in fire protection, they have their limitations. The best solution is to utilize sprinklers in conjunction with fire-rated glass that passes the hose stream test.

HOT TOPICS

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Educational facilities are some of the most critical locations to have fire-rated glass. Since the lives of hundreds of children are at stake, fire safety precautions must be vigorously enforced.

But fires are rare, and glass has to be functional for daily activities. After all, a corridor window in a school is much more likely to be hit by a running body than it is by a raging fire.

So glass in the classroom needs to provide impact protection as well as fire protection. Products such as FireLite Plus provide up to three hours of fire protection, and they meet the highest safety standards for glass (CPSC 16 CFR 1201, Cat. II). That's four times the impact protection of wired glass.

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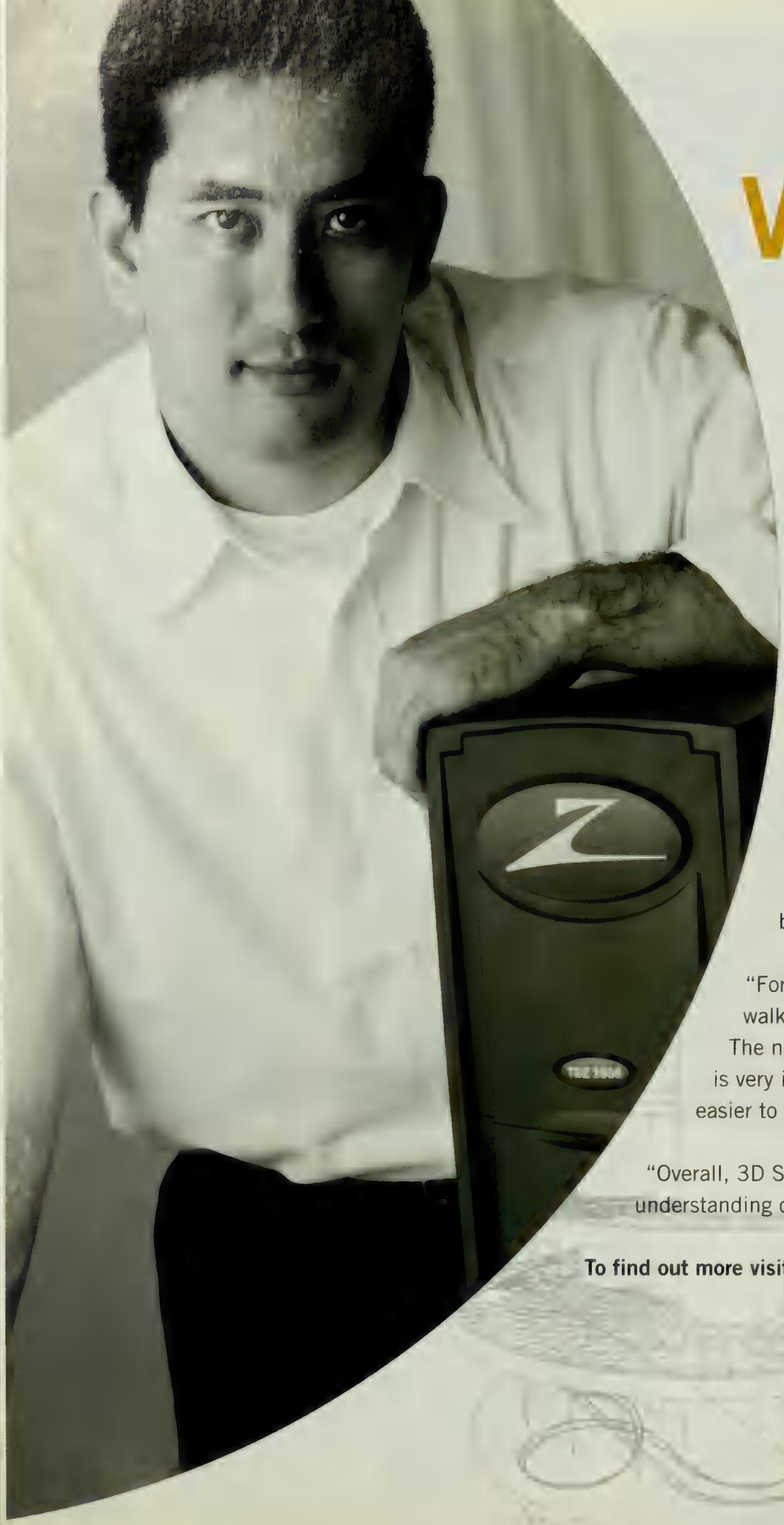
**CIRCLE 26 ON INQUIRY CARD**



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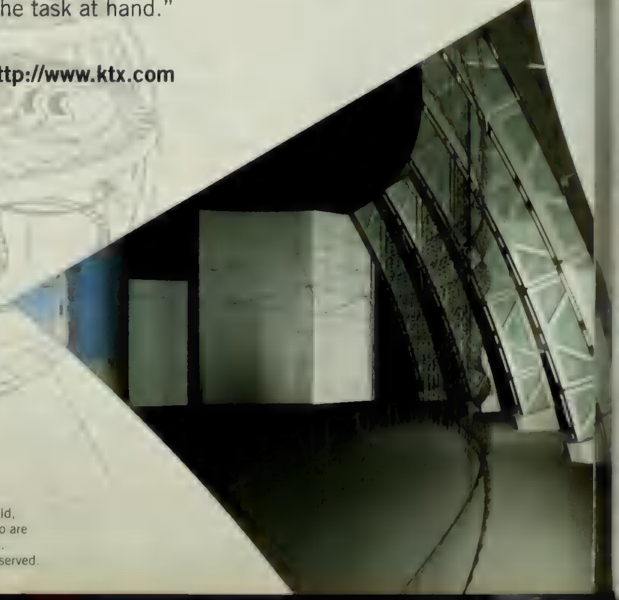

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# When BIGGER is better

## LESSONS FROM AMERICA'S LARGEST FIRMS

**DOES SIZE MATTER? A SURVEY OF "VERY LARGE" FIRMS INDICATES THAT ECONOMIES OF SCALE NEED TO BE BALANCED WITH CREATIVE MANAGEMENT PRACTICES.**

**by Philip Langdon**

You can sense the discomfort in some circles whenever the subject comes up: big firms and their growing share of the profession's work. American architecture, as a segment of the arts, has always venerated resourceful, brilliant (and, when necessary, stubborn) individuals: Richardson, Sullivan, Wright. They, not their firms, are the heroes we revere. But American architecture is also a business, and an increasingly collaborative one. No matter how often critics may present the inspired individual as the source of lasting architectural achievement, the reality is that American architecture is increasingly the province of very large firms—those with 200 to more than 2,000 employees and billings in the tens or even hundreds of millions of dollars.

The AIA Firm Survey hints at the change. "The proportion of AIA member firms with 20 or more employees has almost doubled since 1990," says Kermit Baker, the AIA's chief economist. "In 1996, for the first time, we had enough firms of 50 or more employees to break them out as a separate category." Firms with 50 or more employees, which comprise 2.5 percent of the nation's architecture firms, now collect over 38 percent of the profession's billings. Billings per employee are much higher in big firms than in small ones. The average firm reports $65,000 of billings per employee; in firms of 50 or more, that figure shoots up to $95,000.

Though the AIA survey lacks a category for "very large" firms, it is these that seem to be expanding the fastest, and becoming an increasingly powerful segment of the profession. "Over the course of a century, large firms are getting larger, and there are more large firms," says Robert Gutman, Princeton University's longtime analyst of architectural practice. "McKim, Mead and White was a very big firm at the turn of the century, when it had about 100 people. Albert Kahn had 200 to 300 in the 1920s." Today, according to figures supplied by the firms themselves, Hillier Group, A. Epstein & Sons International, and HKS each have about 400 employees, DLR Group has about 500, RTKL has nearly 600, SmithGroup has over 600, NBBJ, Ellerbe Becket, and Leo A Daly over 700 each, SOM about 800, Gensler over 1,400, and HOK and HNTB over 2,000 employees each. The degree of concentration on architecture ranges widely. HNTB says 206 of its employees are architects, while Gensler has 410 architects; HOK employs the most architects of any U.S. firm: 842.

### Fewer and larger practices

"Architecture still doesn't have a Microsoft equivalent or a General Motors equivalent," says Ed Friedrichs, president of Gensler, the San Francisco–based architecture and interiors firm. Nor has architecture achieved the concentration of a profession like accounting, with its "Big Six." But the design field is gravitating toward fewer and larger practices. "You could equate us more to law firms," offers Friedrichs, noting that "there's been a lot of consolidation in that profession." "The big firms are gobbling fast," says Herbert McLaughlin, a partner and director of design for Kaplan McLaughlin Diaz, a 190-person firm in San Francisco. When a firm's leaders or founding principals are in their 60s, he observes, it may be easy pickings for a bigger firm that has both the wherewithal to make an acquisition and a desire for the greater geographical reach or additional forms of expertise that an acquisition can bring.

Some, like DLR (founded in Omaha in 1966 as Dana Larson Roubal & Associates), have acquired firms in other cities and allowed those offices to operate as relatively autonomous enterprises. It was only last year that all 15 offices under the DLR Group umbrella changed their names to that of the holding company. Other firms have steered more in the direction of HOK's "one-firm philosophy," attempting to shape their acquisitions into a single, highly integrated organization.

Acquisitions and mergers are just one source of the profession's growing concentration. "Gensler has never acquired a firm," says chairman and CEO Art Gensler Jr., FAIA. "We've grown internally." Some

*Philip Langdon is the author of* A Better Place to Live: Reshaping the American Suburb, *among other books. He is writer/editor for the Connecticut Conference of Municipalities and associate editor of* The American Enterprise.

# NBBJ: THE NEW PLAYER IN SPORTS

Four years ago NBBJ Architects had little involvement in one of the big growth areas of architecture: sports and entertainment facilities. Today the Seattle-based firm of more than 750 people ranks third nationally in that field, behind two longer-established leaders, HOK and Ellerbe Becket. The story of how NBBJ got to be a member of the sports-design elite illustrates some of the advantages of very large architecture firms.

NBBJ reassesses its goals every year, and had wanted for some time to expand into sports facilities. In 1995 it got the chance when a group of principals in Ellerbe Becket's sports group in Los Angeles decided to split from their Midwest parent and pursue a quintessentially 1990s concept: "sports as a subset of entertainment."

**NBBJ REASSESSES ITS GOALS EVERY YEAR, AND HAD WANTED FOR SOME TIME TO EXPAND INTO SPORTS FACILITIES. IN 1995 IT GOT THE CHANCE.**

*The members of NBBJ Architects sports group.*

Michael Hallmark, one of the Los Angeles principals (and earlier a founder of Ellerbe Becket's sports practice in Kansas City), says his group considered establishing an independent new firm but decided that was impractical. To succeed at complicated, highly technical sports projects, which often take several years to come to fruition, it's advantageous to be part of a large firm, according to Hallmark. "For us, bigness was important," he says. "The scale of the projects meant we felt we needed to be big from day one. We needed the resources: a vertically integrated group of specialists."

By becoming part of the corporate network of NBBJ, Hallmark and his colleagues were able to assure themselves access to experts on matters such as project management, graphics, and foreign cultures, and to guarantee themselves the capacity to handle highly technical issues, such as retractable stadium domes.

"We toyed with the idea of being a design firm and, when assistance was needed, having an associate architect," Hallmark says. "The problem is, the projects are very technical. You can't associate with just any architect, even a good one, and expect the follow-through to be there."

The addition of the sports group, which now employs nearly 90 architects, has helped NBBJ fulfill what its managing partner, James Jonassen, identifies as a vision of being "a multi-building-specialty firm—experts in a number of building types." The sports group has contributed in other ways, such as "opening our eyes to the ability to communicate with video." The group uses tools of Hollywood moviemakers, such as Silicon Graphics workstations, which aren't normally within the domain of architects. Of that particular tool, Jonassen says, "It was technology we would never have thought was worth the cost." To his delight, it enables the firm to "tell a very complex story in a way that satisfies very short attention spans."

NBBJ prides itself, Jonassen says, on being extremely "studio-focused. There are no layers of management. The unit of delivery of services is the studios. They are almost autonomous." The combination of having studios concentrate on projects and having firm-wide resources such as digital technology, economic analysis, and "experience with alternative delivery approaches, from fast-track to design/build, to bidder design," are key, in Jonassen's view, to how a big firm can prosper and continue to grow.

| Total Number of Employees | Number of Architects | Number of Offices |
|---|---|---|
| 750+ | 600 | 9 |

**Locations:** Columbus, Ohio; Los Angeles; New York City; Research Triangle Park, N.C.; San Francisco; Seattle; Oslo; Taipei; Tokyo.

## GENSLER: "A LEARNING ORGANIZATION"

"In the past we focused on our clients' projects one at a time," says Ed Friedrichs, president of Gensler. "They each had a beginning and an end." Today the San Francisco–based firm, best known for its interiors work, finds that its assignments tend to flow together and stretch far into the future. The clients, many of them companies occupying buildings not only in the United States but throughout the world, are erecting, altering, and updating facilities continually; they want Gensler to help devise an overall strategy for handling their needs. The organization, Friedrichs explains, sees itself as a partner with the big businesses it serves. Its work, he adds, has gone from being "transaction-driven" to being "relationship-driven."

**M. Arthur Gensler Jr., FAIA, chairman/CEO**

Since its start as a three-person practice in San Francisco in 1965, Gensler has grown into a 1,450-person firm with 13 offices in the United States (from Los Angeles to Boston), as well as offices in London, Hong Kong, and Tokyo. "Being diversified geographically means we don't have to bet the company on one city or one location," says chairman and CEO Art Gensler. "There have been times when one office went well and another office went in the tank. We share work."

Repeat work for big clients is a major source of Gensler's billings, which reached a record $170 million in 1997, up 30 percent from the year before. Sony, for example, has had Gensler work on a new studio in Culver City, California, an urban entertainment center in San Francisco, a 13-screen theater complex near New York's Lincoln Center, and small screening theaters (for Sony's corporate review of movies) in Tokyo. Gensler's work for the clothing retailer Gap, Inc., has gone on for three decades. "Our relationships," Friedrichs says, "have really facilitated our growth."

Projects are typically handled by "studios"—groups of as few as 12 to 15 staff members or as many as 30 to 50, who work together on a variety of projects. The premise of the studio system, Friedrichs explains, is that "people who know one another well are likely to produce better results for a client." Kevin Hart, a director of design in the San Francisco office, points out an additional advantage: "Studios are very helpful at making large firms easier to handle for young employees and new employees. If you came to Gensler, you would be joining an office of more than 200 but a studio of 20 to 30. That's your 'home room.'"

| Total Number of Employees | Number of Architects | Number of Offices |
|---|---|---|
| 1,450 | 410 | 16 |

**Locations:** Atlanta; Boston; Chicago; Denver; Dallas; Detroit; Newport Beach, Calif.; Parsippany, N.J.; San Francisco; Washington, D.C.; Hong Kong; Tokyo.

growth is the result of opening multiple offices across the U.S. and overseas. More and more architecture firms have "not three or four offices" but "six or eight or ten," says Jerome Sincoff, FAIA, president and CEO of HOK. "That in itself makes firms larger." HOK now operates 15 offices in the United States and nine in other countries.

Firms establish multiple offices not only to get business in new territories but also because their clients have far-flung operations and want their architects close at hand. Larry Self, HOK's executive vice president, says, "Our clients want the comfort and confidence of knowing that their American architect is going to provide the same quality service in Prague or Shanghai—or any point on the globe—that they get in the U.S."

### Going global

The globalization of trade, which has been official U.S. policy in Republican and Democratic administrations alike, has also spurred consolidation in the architectural profession. Most small firms cannot afford to pursue overseas work; this is mainly the big firms' turf. The AIA found in 1996 that international work, which had risen to $625 million annually, was being done by just under 10 percent of American firms. But international work was being carried out by more than 50 percent of firms that had 50 or more employees. Many businesses, in fields ranging from publishing to automaking, are evolving into "boundary-spanning" organizations that have enormous appetites for construction, renovation, and management of facilities—propelling the growth of big firms. "If you're any good at all at what you do and you work for large clients who are at the top of their businesses, it's almost inevitable you will grow," explains Paul Nakazawa, a management consultant with Pearson Egan Nakazawa in Wellesley, Massachusetts.

From a big-business perspective, it's easier to work with one very large architecture firm than with several smaller ones. Large firms tend to have a businesslike attitude, substantial liability coverage, and a high likelihood of remaining in existence from one decade to the next. Conversely, the smaller the firm, the greater the chance it will disappear. From 1990 to 1996 the number of AIA member firms declined to 15,000 from 17,000.

As a firm becomes large, it can afford state-of-the-art technology and experts, reinforcing its power to outdistance the majority of small to midsize competitors. Architectural information system managers, who run highly sophisticated, interlinked computers, command "very high salaries," says Robert Hillier, head of the 400-person Hillier Group in Princeton, New Jersey. So do top human resources directors. Money is available at big firms, and so are large-scale projects, which can make effective use of specialists. "You have people whose lifetime career is to research building materials and write about them," Hillier emphasizes. "In a large firm, that person has a real place and a real job."

# LEO A DALY: BUILDING FROM TECHNICAL SKILLS

"We speak the language, we understand the language of the project type: the airport," LaVern Rollet says when asked to explain how the firm he works for, Omaha-based Leo A Daly, came to collaborate with Cesar Pelli & Associates on the new south terminal of Washington's Ronald Reagan National Airport. Earlier, Rollet had led a team from Leo A Daly working on an international arrivals building (unbuilt) at Honolulu's airport. He's been working on aviation projects since 1979, when the firm dispatched him to renovate terminals at Los Angeles International Airport.

Daly, the largest privately held architecture firm in the United States, with some 750 employees, about 230 of them architects, has based much of its success on an ability to carry out highly technical projects such as airports, laboratories, hospitals, and educational facilities. Leo A Daly III, FAIA, chairman and CEO of the firm his grandfather founded in 1915, says clients are drawn to the firm in large part because of their belief in the value of experience: "Hospitals want to talk to people who have done a number of hospitals before. They want someone who is coming off a very similar one."

Along with technical expertise, Daly is known for its willingness to open new offices—and on occasion buy established firms—that can broaden its geographic reach and technical skills. "When a bank comes to you and says, 'We want to build 1,000 offices spread throughout the U.S.,' you need to have offices in those areas," Leo Daly observes. The firm's 1991 acquisition of Lockwood Andrews Newnam, the largest civil engineering office in Texas, is part of a strategy aimed at expanding into Texas and Mexico while simultaneously gaining new expertise in environmental and civil engineering. Daly now has 15 offices, four of them in the Far East, the Middle East, and Europe.

The firm's reputation for design has not been as strong as its technical skills. This may help explain the enthusiasm voiced over the hiring, three years ago, of Richard Clark, formerly at Kohn Pedersen Fox, as corporate head of design and as director of design for Daly's 125-person Washington office. Clark, who reports being given "pretty much a free hand," has allowed design to stay with a project longer, as part of a team, instead of having designers quickly turn the project over to production.

**Leo A Daly III, FAIA, chairman and president**

**DALY, THE LARGEST PRIVATELY HELD ARCHITECTURE FIRM IN THE U.S., HAS BASED MUCH OF ITS SUCCESS ON HIGHLY TECHNICAL PROJECTS.**

| Total Number of Employees | Number of Architects | Number of Offices |
|---|---|---|
| 700+ | 230 | 15 |

**Locations:** Atlanta; Council Bluffs, Iowa; Dallas; Honolulu; Houston; Las Vegas; Los Angeles; Omaha; Phoenix; San Antonio; Washington, D.C.; Berlin; Dubai, U.A.E.; Hong Kong; Madrid.

**Above: Generations of Dalys have worked in the firm. Left to right: Leo Daly Sr., William T. Daly, AIA, and Leo A Daly Jr., FAIA.**

# RTKL: Going International

"We're in a shift," says Lisbeth Quebe, the head of firm-wide marketing for Baltimore-based RTKL. With her health-care specialist husband Jerry Quebe and corporate practice specialist James C. Allen, Quebe left Perkins & Will to open a Chicago office for RTKL in 1996. She observes that in the past RTKL "had always expanded geographically. It was a way to be closer to our clients."

Today RTKL is expanding in a different fashion, concentrating not only on being physically near its clients but also on pursuing "a sector approach." That means building the firm's strength in its core markets of retail, entertainment, hospitality, health care, corporations, and government. Clients increasingly expect expertise from their architects, and RTKL believes that firms must deepen their knowledge of client issues in order to develop, rather than simply respond to, the next generation of ideas.

Disciplined, rational plotting of the firm's direction is one of the things that makes RTKL "a very strong company," according to Mark Zweig of Zweig White and Associates management consultants. In 1967 RTKL, with four principals and 45 employees, was one of the first architectural practices to decide it needed a leader who would concentrate on management.

The partners who reached that decision brought in a young manager, 28-year-old Harold Adams, who had gained high-level corporate and governmental exposure at John Carl Warnecke, working on projects with President Kennedy and his Cabinet, among others. Thirty-one years later Adams remains in charge, leading an organization that has grown to nearly 600 employees, with 309 architects, and has become increasingly international in its ambitions.

"We manage our affairs in a pretty conservative, businesslike way," Adams says. "While we take risks, it's all studied risk." Two of Adams's chief responsibilities are identifying market sectors where a major investment of money and personnel is likely to pay off in the long haul and going after international work, which now accounts for more than a third of RTKL's revenue.

Design and production, Adams says, is best done by "teams that have worked together repeatedly." He notes, "Over the years, we've broken our office down into studios. Those studios are concentrated on a specific project type." Studios allow RTKL to amass in-house expertise, which has become critical as the pace of decision-making has accelerated. Today, he says, "you need expertise *now.* If you don't have it, you will miss a market opportunity."

John Gosling, a vice president and urban designer in the Washington office, observes, "Once you get an expertise, you tend to attract the larger projects. You get 10- to 25-acre urban renewal properties, as opposed to one or two acres." A firm can also export the expertise and even "re-import" it later, as in the case of high-rise office building technology or housing.

In five decades RTKL has taken a local practice regional, then national, and finally global. Its most recent transformation, still in progress, involves going from being a large national practice doing business overseas to becoming a truly international practice. There was a time, Gosling says, when the firm "had some difficulty promoting people who did not grow up in the mother ship"—the Baltimore office. But now the firm has principals born in Britain, Argentina, China, and India. The direction is unmistakable.

**Harold L. Adams, FAIA, chairman and CEO**

**TODAY, RTKL IS EXPANDING IN A DIFFERENT FASHION, BUILDING ITS STRENGTH IN ITS CORE MARKETS.**

*RTKL's board of directors. Back row, left to right: Kenneth V. Moreland, Paul F. Jacob III, AIA, Lance K. Josal, AIA, Paul G. Hanegraaf, AIA. Front row: Todd C. Lundgren, AIA, David I. Brotman, FAIA, Harold L. Adams, FAIA, David C. Hudson, AIA.*

| Total Number of Employees | Number of Architects | Number of Offices |
|---|---|---|
| 574 | 309 | 8 |

**Locations:** Baltimore, Chicago, Dallas, Los Angeles, Washington, D.C., Hong Kong, London, Tokyo. Affiliates: Cologne, Guadalajara, Shanghai.

A firm that establishes expertise in rapidly expanding sectors, such as sports facilities or criminal justice facilities—two specialties in which HOK is strong—gathers tremendous momentum. At some point, the best such firms learn that the objective, as Nakazawa explains it, is not just to be "in a market," it is to "lead the market." That's what generates continuing rewards and keeps a staff excited. The leader of a market sector can ride its position to worldwide success.

Often, success in the United States leads to success overseas and then back again. RTKL used its decades of experience in designing American shopping centers to win big retail assignments overseas. And the foreign work, some of it on a larger scale than in the United States, has inspired the firm's designers. A retail specialist in RTKL's Baltimore office marveled at a Japanese mall with a ski slope in its core. International work has set the firm thinking about new ways for retail complexes to captivate the public. The "ID8" section of RTKL, with its eclectic mix of architects; interior, graphic, and industrial designers; and people from television, is dreaming up not just buildings but the entire shopping-cum-entertainment experience.

Every big-firm leader attributes some of the rise of the very large firms to changes in the nature of building design. "Projects have gotten larger and more complex, and clients want them done faster," Hillier observes. The first corporate headquarters Hillier produced, a 500,000-square-foot facility done 15 years ago for Beneficial Corporation, took four years from start to finish; by contrast, Hillier's latest headquarters, 890,000 square feet for Bristol-Myers Squibb, was done in 15 months. Big architecture firms typically understand alternative delivery methods, such as fast-track construction and design/build. Most big firms can also spread the work across more than one office. When RTKL's Dallas office landed a three-hotel commission in the Bahamas, the project was shared with the Chicago and Los Angeles offices because of the need for speed.

One of the motives for continually growing is the desire to attract and retain talented younger people. That's accomplished, in part, by providing opportunities for promotion. "A lot of it boils down to statistics," says Hillier. One principal per 10 to 30 employees is an economically reasonable ratio, he calculates; therefore, "a firm has to grow by another 30 people before it can add another principal." If growth stops, the best staff members on the way up may depart.

For the foreseeable future, bigness in architecture seems likely to keep ratcheting upward. The consolidation occurring among corporate clients shows no signs of abating, and those mergers and acquisitions will spur demand for more unified architectural services, Nakazawa believes. "If BankAmerica and Nationsbank merge, they're going to want fewer relationships—and more from the ones they deal with. How many people do you want to educate?"

"We're at a real turning point in the profession," says Harold Adams, chairman of RTKL and of the AIA's Large Firm Roundtable. (Twice a year the roundtable convenes the heads of big firms—those with at least 50 registered architects who are AIA members—to discuss concerns such as insurance, architecture education, and legal questions.) "With the globalization of architecture, we will see some big mergers," Adams predicts. Will those mergers be "within countries," he asks, or will they be "across borders"? He answers his own question: "Both."

Is this the death knell for small firms? Although AIA surveys indicate that from 1990 to 1996 many two- to four-person firms disappeared, everyone interviewed for this article agreed that there will always be a place for small firms, which have lower overhead and the ability to give each client a principal's full attention. There will also be room for smaller firms that focus on artistic innovation. "Design firms" like Cesar Pelli & Associates and Kohn Pedersen Fox also seem to have a tight grip on certain clients looking for distinctive design. Indeed, design firms with prestigious names coexist amicably with very large firms, teaming up with them to carry out big, complicated projects both here and abroad.

It's at some in-between size, where the principals' involvement diminishes but the economies of scale are not yet present, that the crunch will be felt, according to the apostles of bigness. "The firm that's really problematic," says Hillier, "is the 20- to 50-person firm that does midsize office buildings, firehouses, canned stuff you can take off the Internet and customize." Maybe. But Gutman notes, "There still are regional firms in many parts of the country that do pretty well because there's a preference in many quarters for local firms that can be contacted readily. The problem many big firms have is that they're regarded as impersonal and distant."

### Does design suffer?

Another analyst of architectural practice, Dana Cuff at UCLA, says large firms are always confronted with the question, "How do you maintain design quality?" Currently the very large firms deal with that issue predominantly by breaking themselves down into "studios"—groups that are large enough to handle all the components of a project and small enough to operate as a team. This arrangement works best, says consultant Weld Coxe, when the studio is headed by a principal who brings in work and has the authority to commit the firm. If studio heads have to go higher in the hierarchy for decisions, clients quickly become dissatisfied, Coxe says.

With a studio-based organization, "the same people can follow the project all the way through," says Bruce Fowle, senior principal at New York's Fox & Fowle. Such follow-through has become more critical, Fowle adds, as "integration of plumbing, mechanical, fire control, communication wiring," and other elements of buildings has grown in complexity. The practice that some big firms used to employ—that of generating a design and then handing it off to the production department—is on the wane. This is welcome news both for design quality and for the morale of lower-echelon staff members, many of whom were once consigned to monotonously repetitive tasks. (Another reason for the rise of the studio-based structure is that corporations have shifted much decision-making downward, from the top executive to vice presidents or managers, who are more comfortable dealing with studio heads. To make the client comfortable, the organization of a big architecture firm must mirror the current fashion in corporate hierarchies.)

How well a firm with a slew of offices can deliver on design quality is subject to debate. A. Eugene Kohn, a senior partner at Kohn Pedersen Fox, says his firm's decision to "concentrate our design and technical skill in two places"—a Manhattan office with about 170 employees and a London office with about 80 employees—has enabled the firm to maintain a consistent level of quality. Bruce Fowle sees another hazard in bigness: "The larger it gets, the more it becomes a business, where there's a greater concern for the bottom line and all the things that go with it."

Bigness is good for clients, employees, and projects in some respects and bad for them in others. Those who run big firms are aware of the dangers, and many invest in abundant travel, conferences, educational programs, and other efforts aimed at keeping their organizations attractive to employees and to clients. They've heard E. F. Schumacher's memorable phrase, "Small is beautiful," and they know that misgivings about bigness run deep. Size cannot be safely touted in all quarters.

"When we go in to see a client, we don't talk about size," Hillier says. "Architecture is still a personal business. It's still a service that's delivered one-on-one. So many clients talk about 'their architect' and not about 'their architecture firm.'" ■

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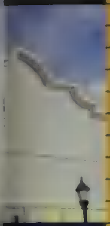

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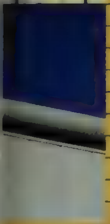

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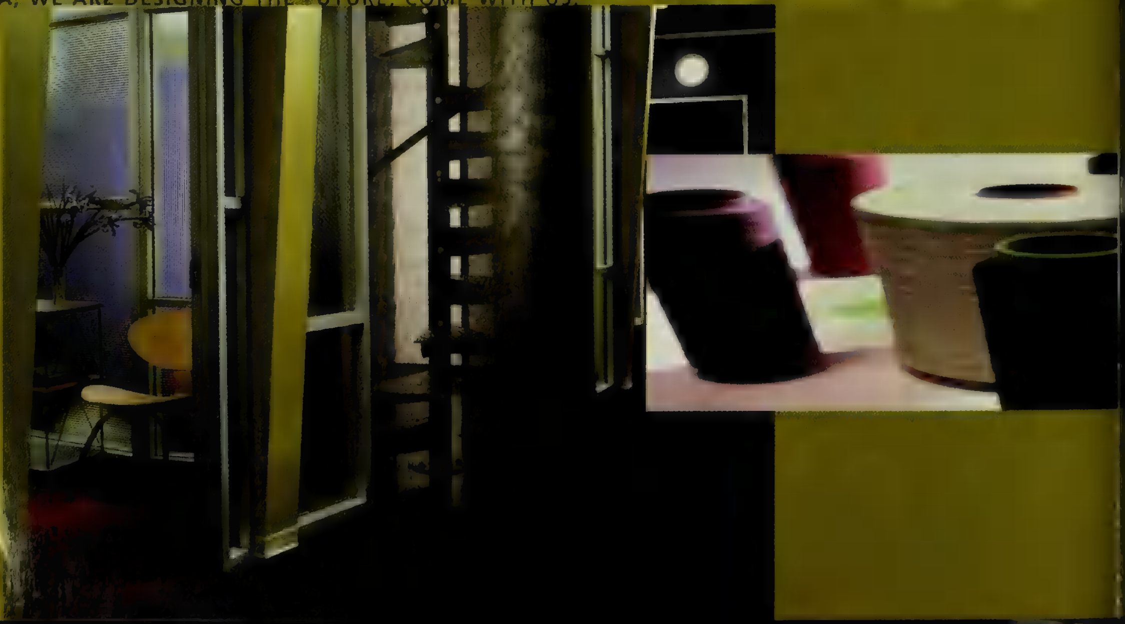

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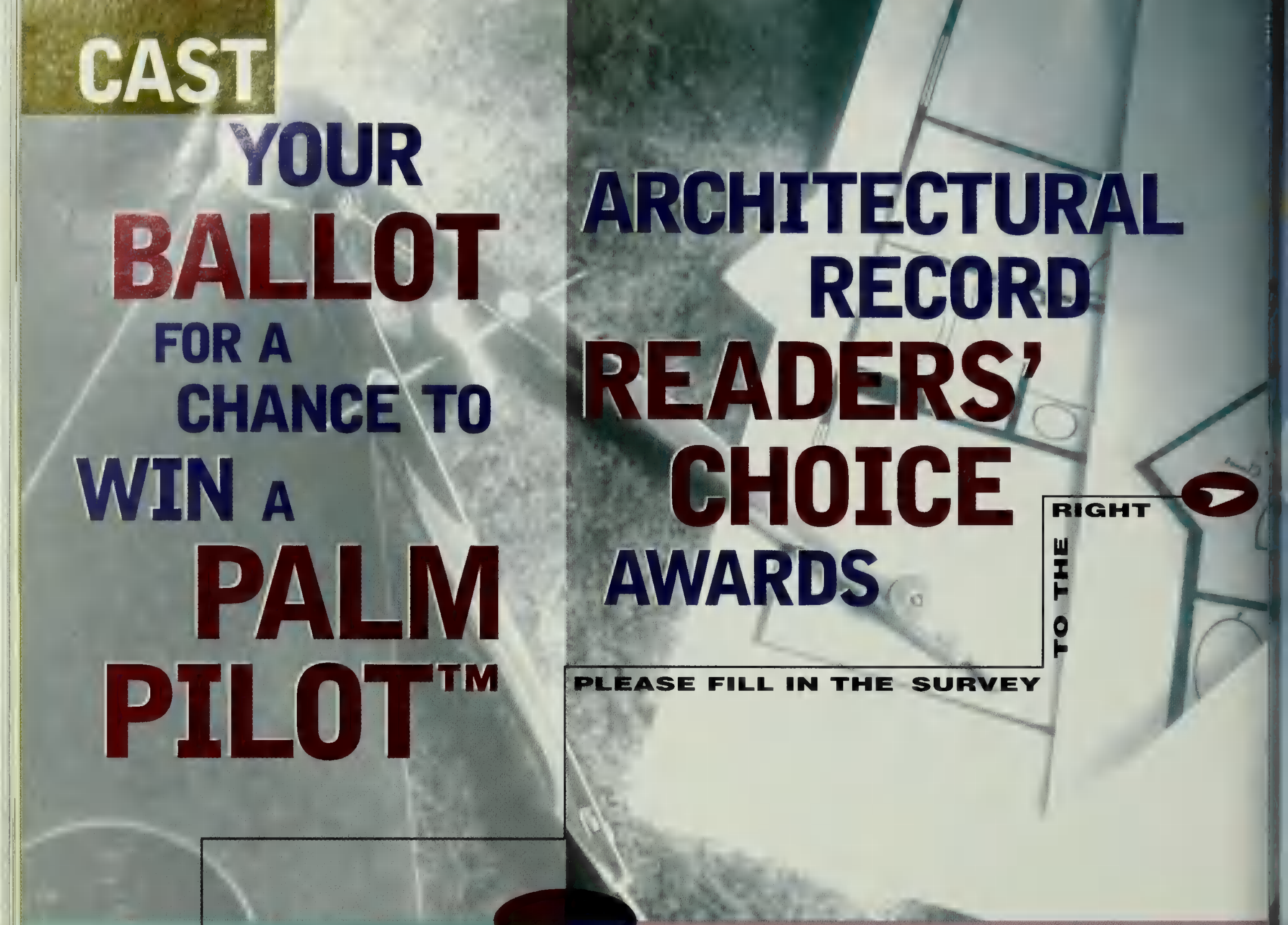

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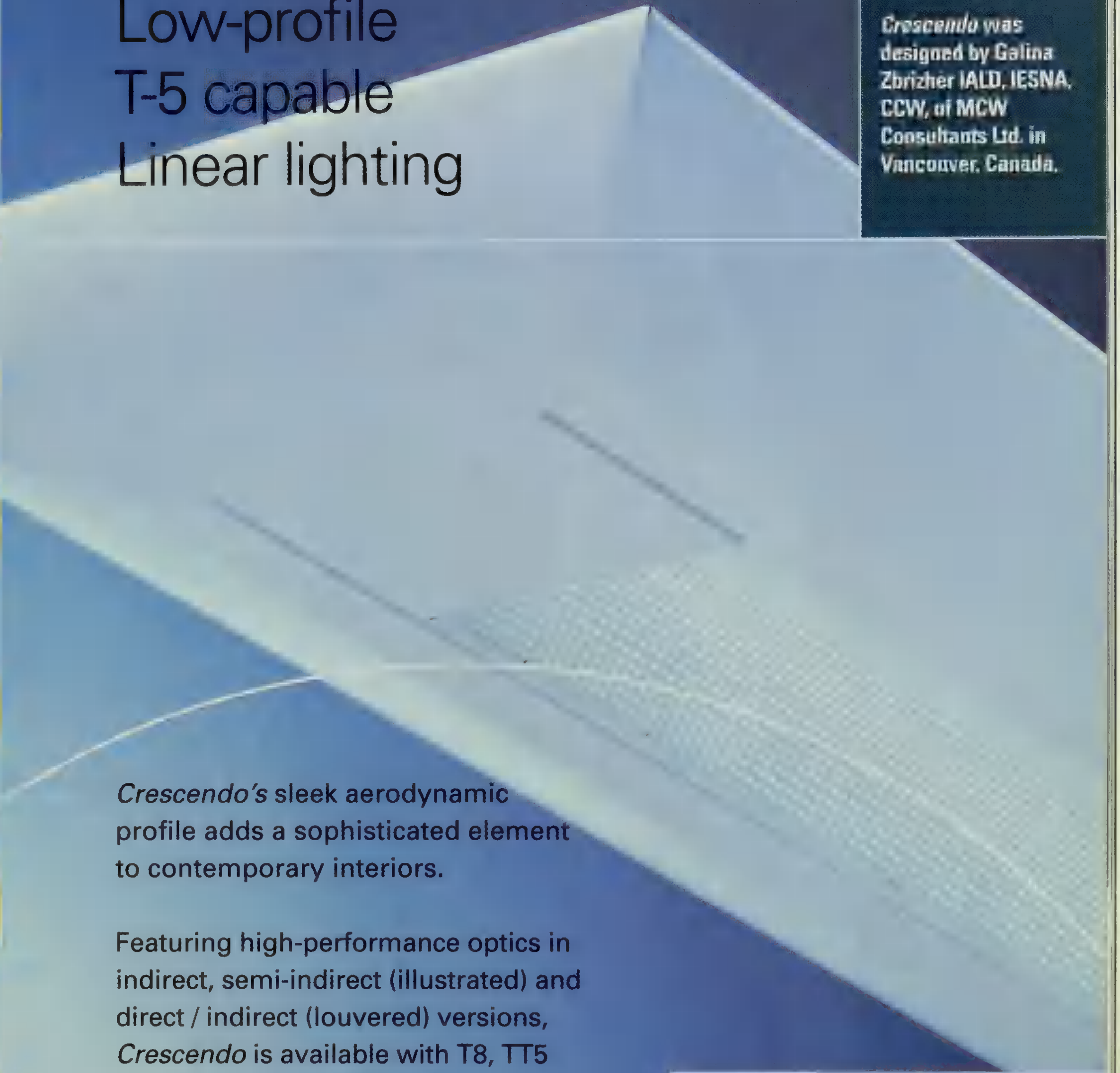

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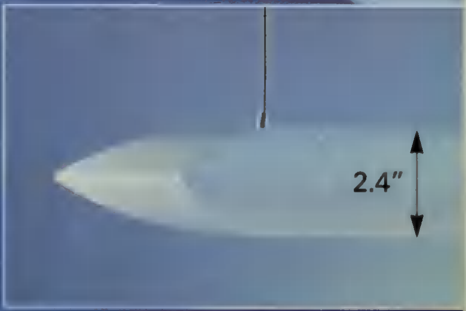

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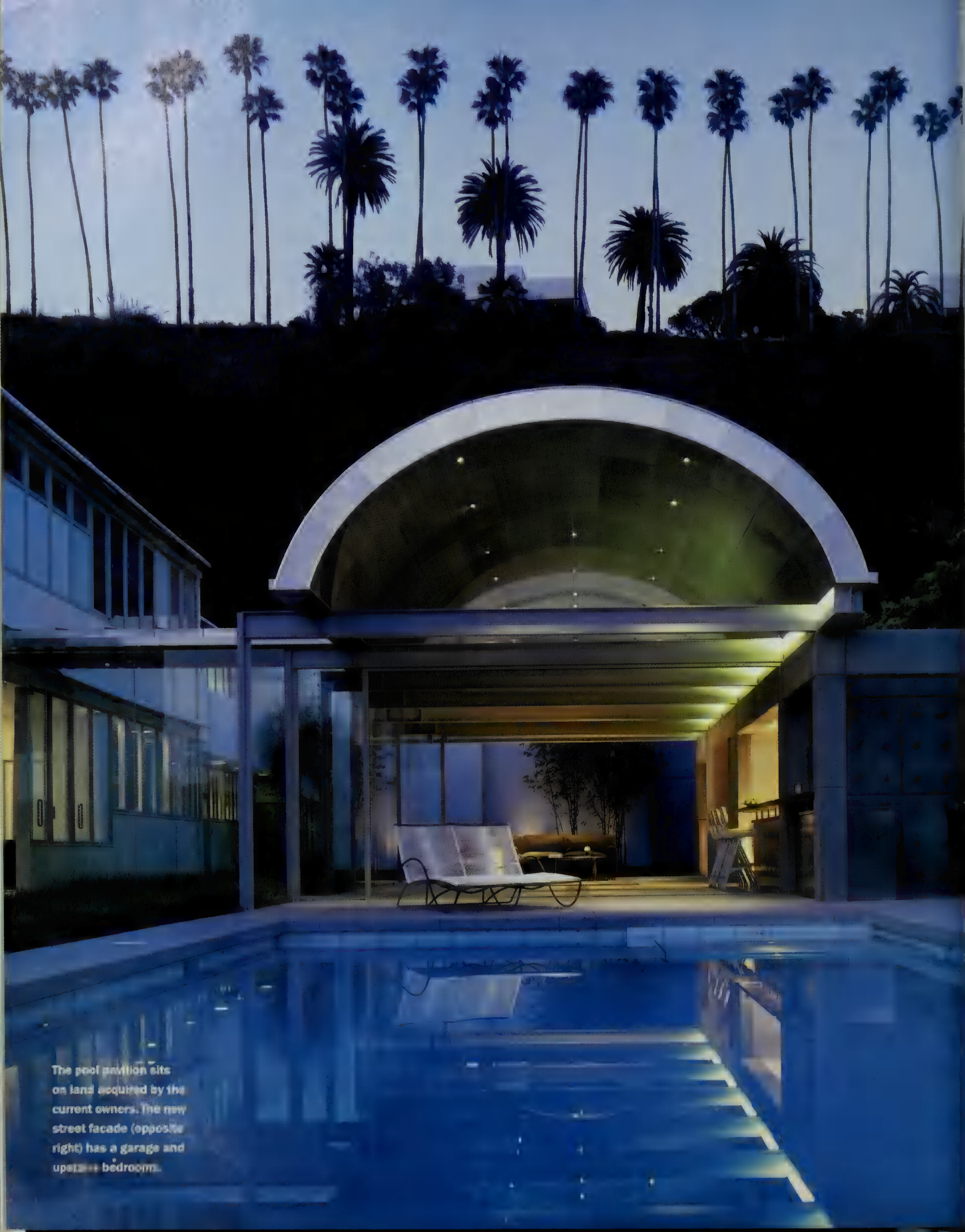
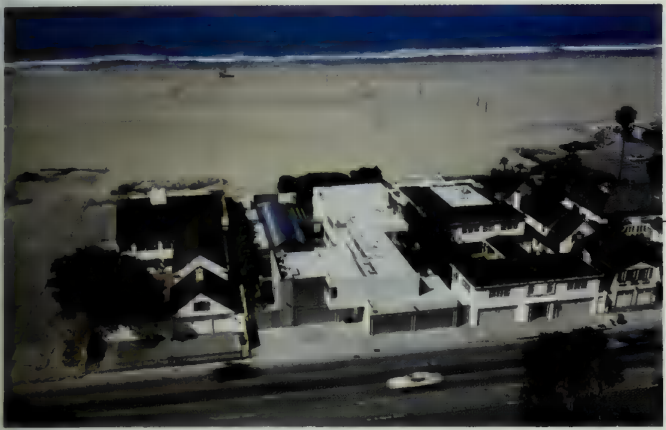


The pool pavilion sits on land acquired by the current owners. The new street facade (opposite right) has a garage and upstairs bedrooms.

# **CRITICISM:** Adding to Neutra's famous **LEWIN HOUSE,** Steven Ehrlich designed a beautiful pavilion. But is it a happy marriage?



**by Thomas Hines**

In Charles Reznikoff's Hollywood novel, *The Manner Music*, a noted film director builds a splendid house on the Santa Monica beach, designed by a famous Modernist architect. The real-life prototypes for the novel's protagonists were Reznikoff's friend, the director Albert Lewin, and the architect of Lewin's beach house, Richard Neutra. Since its completion in 1938, Neutra's fabled Lewin House has undergone two major renovations, one in the early 1980s by Gwathmey Siegel & Associates and a recent transformation by its current owners, who have nearly doubled the size of the property and commissioned large additions by Steven Ehrlich Architects.

Built on a long, narrow slice of beachfront property, the Neutra-designed house is entered on one of its long sides, down a walk that runs nearly its full length to a handsomely overscaled front door. A library and a living room occupy the west half of the house, from which a prowlike glazed extension looks to the ocean. On the east, toward the street, lie a kitchen, service areas, servants' quarters, and garages. From the entry hall, a sensuously curving, minimally detailed staircase leads to five bedrooms and a study/sitting room. Atop the curving glass bay of the living room, the master bedroom opens to a private balcony, affording salt-air breezes and sweeping views of the coast. With its flat roof, its long lines of ribbon windows, its off-white stucco, and its navy blue trim, the house assumed an appropriately nautical ambience when it was built.

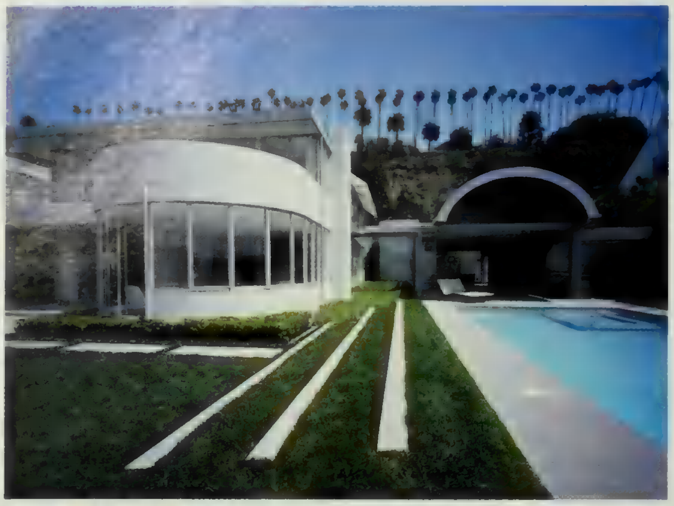
Neutra's design sensibilities grew out of the time he spent in the atelier/salon of the minimalist pioneer Adolf Loos in Vienna in the 1910s. A staunch Amerophile, Loos turned his disciples to the New World, where Neutra moved in 1923 after working in Berlin for the Expressionist master Erich Mendelsohn. In 1924 Neutra worked in Chicago for Holabird & Roche and in Wisconsin for Frank Lloyd Wright. Since most of Wright's work was then in Los Angeles, Neutra was encouraged to establish his practice there. His "Health House," designed and built from 1927 to 1929 for the physician Philip Lovell in the Hollywood Hills, became one of the Modern movement's most celebrated structures.

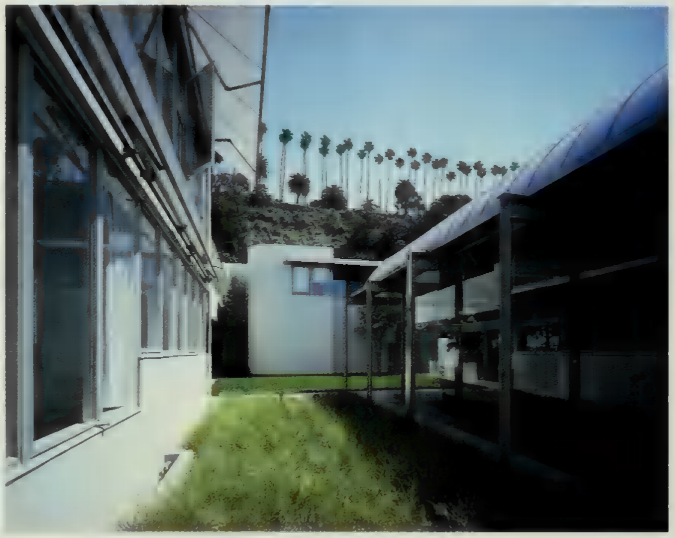
Neutra's career was greatly enhanced by connections with important movie clients. The movie industry, which not only survived the Depression but thrived on America's need for escape, provided major support for Neutra's work in the 1930s. His major commissions from the era include the Laemmle Building for Universal Pictures at Hollywood and Vine (1933), a house for the actress Anna Sten in Santa Monica Canyon (1934), and a grand villa in the San Fernando Valley for director Josef von Sternberg (1935). In those flat-roofed, elegantly minimal residences, Neutra combined his penchant for crisply detailed orthogonal geometry with dramatically curving surfaces. Much of this spirit made its way into the Lewin House.

Educated at Harvard, Albert Lewin moved to Hollywood in 1924 to join Metro-Goldwyn-Mayer, where under Irving Thalberg he became head of the story department and directed such "surrealist" films as the first screen version of Oscar Wilde's *The Picture of Dorian Gray* and *Pandora and the Flying Dutchman*. Lewin, observed critic Maurice Zolotow, was "one of the small number of Hollywood literati who wished to raise the cultural level of pictures." He was highly attuned to the visual arts and owned a famous collection of paintings, which included works of Surrealists such as Man Ray and Max Ernst. Lewin was also keenly interested in Modernist architecture. Knowing the Sten and von Sternberg houses, he eagerly turned to Neutra for his own house.

*Thomas Hines is a professor of history and architecture at UCLA. He is the author of* Richard Neutra and the Search for Modern Architecture *(1982) and* Irving Gill and the Architecture of Reform, *set to be published in 1999.*

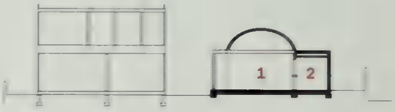
**Project:** *Addition to 1938 Lewin House, Santa Monica, California*
**Architect:** *Steven Ehrlich Architects—Steven Ehrlich, FAIA, principal-in-charge; James Schmidt, AIA, project architect; Nick Seierup, AIA, Brent Eckerman, Tim Champ, Supachi Kiatwankul, Pierre Paley, Troy Williams, Jonathon Riddle, Todd Flournoy, Juergen Zimmerman, Tina Hollenbacher, design team*
**Contractor:** *Lautenschlager, Inc.*





In 1938 the Lewin House sat in splendid isolation (below). Ehrlich picked up the curve of the existing house's prowlike living room as well as the "outrigger" framing of later Neutra houses and applied them to his pool pavilion (top). A glass link between the house and the pavilion preserves views to the ocean (opposite). Pavilion, house, and garage wing occupy the site (above).

1. *Entertainment*
2. *Kitchen*
3. *Barbeque*
4. *Garage*



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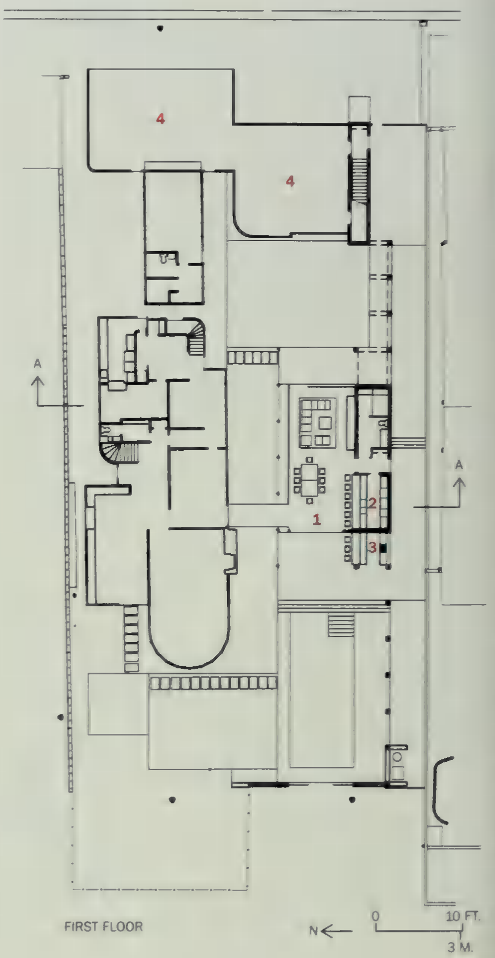

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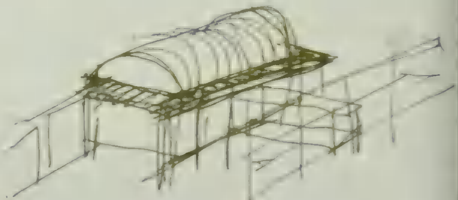


After his retirement from motion pictures, Lewin and his wife returned to New York. Their house went through a succession of owners, attentive and otherwise, including the legendary Mae West, who allowed the dwelling to be badly abused by her menagerie of pet monkeys. Once, after a visit to his celebrated "client," as Neutra liked to refer to all users of his buildings, he described her decorative style as "Mae West Baroque."

### Changing a Modernist landmark

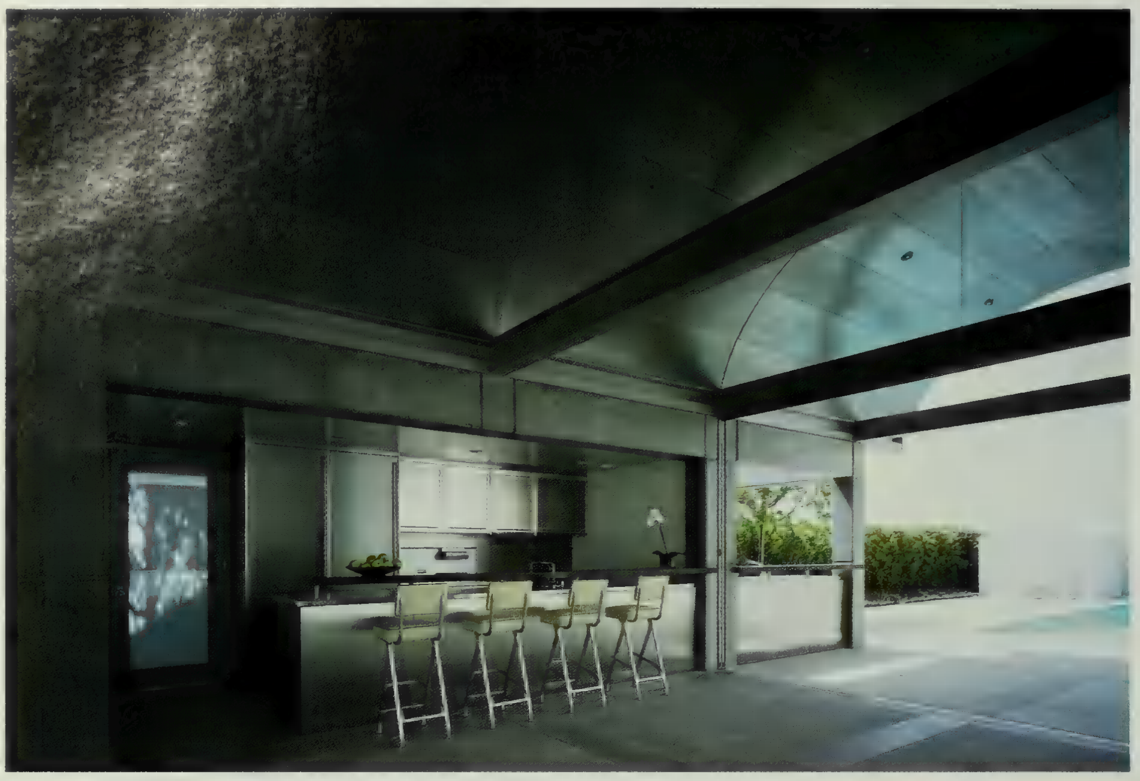
Years later, the house was purchased by François de Menil, who commissioned Charles Gwathmey to renovate the structure with minimal alterations to Neutra's design. One of Gwathmey's small but effective changes lay in his realization that while the master bedroom opened onto an appealing curving deck, there was no such amenity in the adjacent guest room. So Gwathmey created a smaller, rectilinear guest room balcony on the cantilevered overhang that Neutra had intended solely as a shading device for the library beneath. A sympathetic new door and railing made the converted balcony read as a thoroughly rational and integrated part of the original design.

The only disappointing note in Gwathmey's sensitive renovation was his decision to change the exterior colors from the original off-white and navy blue to light gray trimmed with darker gray, thus losing the crispness of Neutra's colors. More successful was his use of rich pastel colors on Neutra's original white interiors. These colors served as an ideal background for the client's collection of 20th-century art, including a painting by Max Ernst, an appropriate echo of the artist's visits to the house.

Recent renovations and additions by Steven Ehrlich have affected the Lewin House more palpably. An architect who cultivates his affinities with previous generations of Southern California Modernists, Ehrlich had earlier designed an effectively detached guest house addition to Neutra's Loring House in the Hollywood Hills, a classic example of the late architect's increasingly relaxed work of the 1950s.

**TAKEN ON ITS OWN, THE PAVILION IS A FINELY EXECUTED STRUCTURE, IMMACULATELY DETAILED.**

In the Lewin project, Ehrlich has returned the stucco to its original off-white but retained the muted gray that Gwathmey had painted the trim. Most of Ehrlich's changes in the original structure have been minor. His major impact has come in his additions to the house.



**Designed for entertaining and enjoying access to the outdoors, the pool pavilion has a kitchen, a dining counter, and a barbeque area. Steel framing that reaches beyond the glass walls of the pavilion refers to "outrigging" that Neutra used in houses from the 1940s and 1950s (opposite).**

The current owners are a couple—a real estate developer and a political consultant—with one child. After acquiring the adjacent vacant lot to the south, they commissioned Ehrlich to enlarge one of the five upstairs bedrooms, to design an attached, streetfront two-story guest house and servants' quarters, and to construct a large, glass-walled pool pavilion in the space between that addition and the beach. With the additions, the house's original area of nearly 7,500 square feet has been increased to almost 11,000. New garages facing the street contain spaces for eight cars. The clients express great happiness with the results.

Taken on its own, the pavilion is a finely executed structure. East, west, and north walls are of fixed and sliding glass, connected on the north to the original house by a glazed, covered passageway. Pushed to the property line, the south side of the pavilion, with kitchen, bar, and bathrooms, is made of contrastingly heavy concrete. Particularly effective are the sensuous fixtures and immaculate detailing of these spaces. The pavilion is topped by a handsome, steel-roofed, cycloidal vault that rests on a structure of exposed steel posts and beams.

The chief flaw of the pavilion is, ironically, an element that Ehrlich designed as a well-intentioned gesture to Neutra: something Neutra called "spiderleg outrigging." Neutra mainly employed the minimalist "outrigging" in his orthogonal, flat-roofed, one-story structures of the late 1940s and 1950s to suggest the figurative extension of the roofline to infinity and a simultaneous anchoring of it back into the earth. He never used it in the 1930s, when the Lewin House was built.

Though Ehrlich's neo-spiderlegs are extensions of his structure's steel supporting beams, they lose their meaning as props for the cycloidal vault, a crowning element that imparts to the one-story pavilion the effect of a larger structure. It is three-fourths the height of the two-story house next door. Because of its sheer girth and its siting close to the older building, the pavilion vault competes with the house's orthogonal leanness. While it might have been dazzling on another, detached site, the pavilion, despite its top-of-the-line detailing, crowds and overwhelms the original structure.

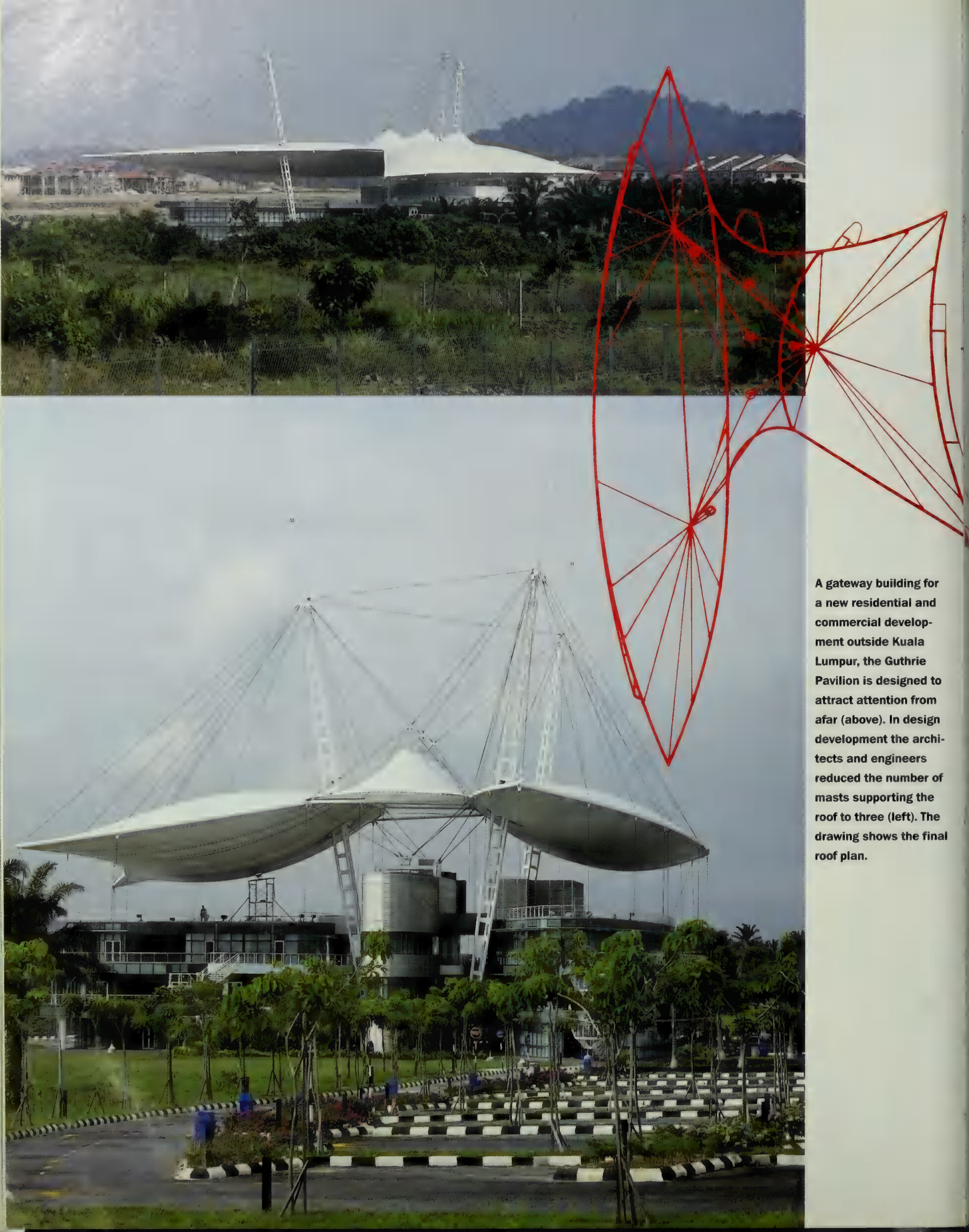
The same is true of Ehrlich's streetfront additions, though these elements lack the pavilion's relative lightness. With heavy segments of reinforced concrete and stainless-steel panels, they run counter to the sleek minimalism of the Neutra original, which, in any case, the new street facade totally covers from view. Partial glimpses from the public beach and a bird's-eye view from the distant palisades to the east are the only encounters the public now has with this significant example of Southern California Modernism.

**THE PAVILION'S CHIEF FLAW IS A WELL-INTENTIONED GESTURE TO NEUTRA.**

While the current owners might naturally state that it is no one's business but their own, why did they feel the need to add so extravagantly to their already large and remarkable house and, in doing so, damage its identity? With a successful practice in California and beyond, why did Ehrlich feel the need to assert his own style so forcibly that it overwhelms a now-compromised landmark? It is unfortunate that the current handlers of the Lewin House failed to exercise restraint in modifying this historically significant structure. ■

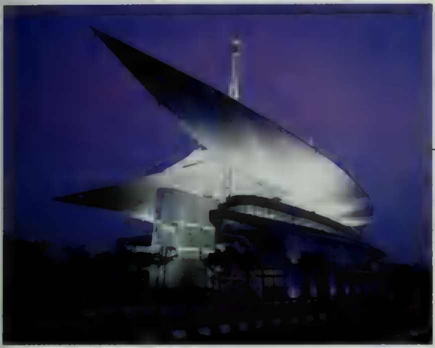
**Sources**

**Tempered frameless glass:** *Giroux Glass*
**Brushed stainless steel:** *Dorland Co.*
**Aluminum windows and sliding pocket doors:** *Fleetwood*
**Pavilion cabinets:** *Meyer & Reeder*
**Pavilion kitchen:** *Bulthaup*
**Glass table in pavilion:** *Knoll (Barcelona Table)*
**Barstools in pavilion:** *Warren MacArthur (c. 1940)*
**Colored nesting tables:** *Wor-de-klee*
**Sofa:** *Thomas Callaway Associates*
**Double lounge on patio:** *Walter Lamb (c. 1940)*



A gateway building for a new residential and commercial development outside Kuala Lumpur, the Guthrie Pavilion is designed to attract attention from afar (above). In design development the architects and engineers reduced the number of masts supporting the roof to three (left). The drawing shows the final roof plan.

# Tensile technologies and irregular geometries turn Ken Yeang's GUTHRIE PAVILION into a tropical high-wire act.



**The weave of the glass fiber used for the roof dissipates sunlight and glare during the day but catches light from spots at night.**

**by Clifford Pearson**

Umbrellas have been shading people for hundreds of years, so it's not surprising that architects would borrow the idea to protect buildings from the full force of the sun. In the suburbs of Kuala Lumpur, Malaysian architect Ken Yeang has married the old-fashioned umbrella with the latest tensile and inflated-fabric technologies to shade the Guthrie Pavilion, a sales office and golf course clubhouse.

The project continues Yeang's career-long exploration of bioclimatic design—an exploration that has led him to use plantings and shaded "sky courts" in high-rise office buildings, to position service cores so as to block direct solar radiation, and to maximize natural ventilation in modern structures [RECORD Pacific Rim, March 1993, page 26].

The Guthrie Pavilion stands at the entrance to a new suburb being developed about 20 miles west of Kuala Lumpur by the real estate arm of an agricultural conglomerate. The company's plans for the area include houses, offices, light-industrial facilities, and a golf course. "The client wanted a landmark building to draw attention to the development," explains Yeang. "It's the first building you see from the highway, so they told us to make it visually stunning."

The 50,000-square-foot pavilion serves two primary functions. Half the structure is a showcase for selling houses and land in the development, while the other half is a clubhouse for the adjacent golf course. The idea is to use a round of golf and then a drink on the roof terrace to close business deals. Capturing the views and creating comfortable outdoor spaces are critical to the success of the building.

### An idea brought back from the south of Spain

The client, Tan Sri Dato Abdul Khalid Ibrahim, the head of Guthrie Property Development, had returned from a visit to Expo '92 in Seville, Spain, impressed by the inflated-pillow roof on the German Pavilion. He was determined that the gateway building at his company's new development have a similar roof. While looking for a Malaysian architect for the job, Tan Sri Khalid heard about Yeang's firm and learned that the architect had been experimenting with fabric structures for years. Indeed, Yeang had used them as components of several larger projects—as a roof canopy on the 40-story Menara Budaya office tower in downtown Kuala Lumpur, as an entrance canopy for the Wirrina Cove Hotel in Adelaide, Australia, and as partitions in the Conoco offices in Kuala Lumpur.

While the inflated roof of the German Pavilion in Seville was circular in plan, Yeang realized that tensile technology allowed great freedom in terms of geometry. As long as it shaded the building and was properly secured, there was no reason the Guthrie roof couldn't employ irregular shapes. After working on several different schemes, Yeang and the client selected a design with two different inflated roofs connected by a trio of small, uninflated fabric cones. Each tensile structure covers a different portion of the building: there is a lozenge-shaped pillow over the office and exhibition wing, a trapezoidal pillow over the clubhouse, and the suspended cones over the service core.

Altogether the fabric canopy covers an area of 29,000 square feet, shading the three-story structure below and making the expansive roof terraces comfortable outdoor spaces. The building itself, while irregular in plan, is a conventional concrete-frame structure with aluminum infill panels and tempered clear glass. Thanks to the canopy and aluminum sunshades projecting from the east and west facades, clear glass could be specified without increasing solar-heat loads. Large expanses of it provide great views for people inside the pavilion and reduce the need

**BY SHADING THE BUILDING, THE CANOPY REDUCES ENERGY CONSUMPTION AND CREATES COOL ROOF TERRACES.**

**Project:** *Guthrie Pavilion, Shah Alam, Selangor, Malaysia*

**Client:** *Guthrie Property Development Holding Sdn. Bhd.*

**Architect:** *T. R. Hamzah & Yeang—Ken Yeang, principal-in-charge; Seow Ji Nee, project architect; Paul Mathews, Ian Morris, design architects; Idris Clywd, Michael Jamieson, design development architects; Richard Coutts, Anton Petschy, design team*

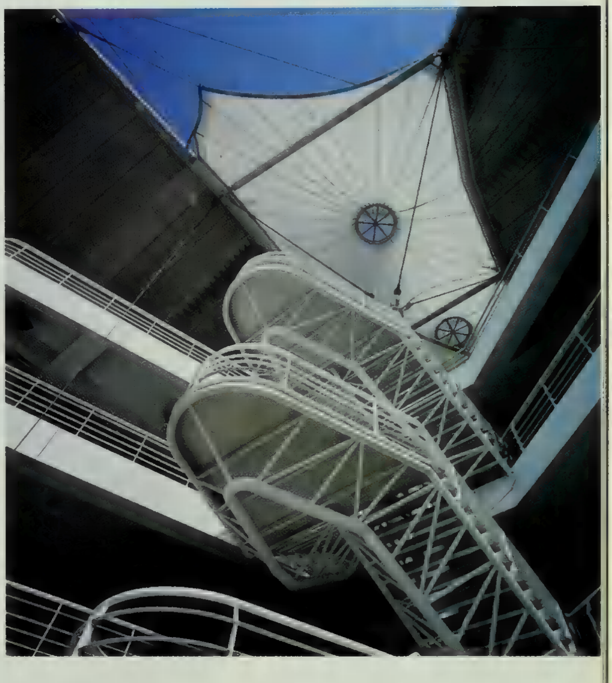
**Engineers:** *Tahir Wong (C&S); PCR (mechanical/electrical); IPL Radolfzell Ingenieurplanung Leichbau (canopy)*

**Quantity surveyor:** *Azhar Rouse & Hisham*

**Fabric manufacturer:** *Sediabena/Flontex JV*

**General Contractor:** *Syarikat Abdul Rahman-Sediabena JV*

By protecting the building from the full force of the sun, the fabric roof reduces energy consumption by an estimated 66,300 kilowatt hours each year. The canopy creates about 10,000 square feet of shaded outdoor spaces, including decks and roof terraces on several levels (above). Parking for more than 450 cars is provided by surface lots around the building (right).



**On the west facade (above) and the east elevation, anodized aluminum sunshades project from the curtain wall and reduce solar loads. The curtain wall is made of tempered float glass and 2.5-millimeter-thick solid aluminum panels. Because it is shaded by the fabric canopy, the building can use more glazing than is typical in the tropics. The exterior stair (right) is galvanized steel.**

for electric light. Though the building is air-conditioned, operable windows allow for natural ventilation in case of power failures or unusually cool weather.

The building's inflated roofs are made of glass fabric wrapped around tubular-steel frames that are supported by internal steel skeletons. The fabric's weave diffuses sunlight to prevent glare. It also has a nonstick coating and is totally inert so nothing can grow on it—important properties in a tropical climate where plants, molds, and fungi flourish. Microbes, however, can live on top of water trapped inside the inflated pillows, so the designers made sure the roofs are well drained.

### How the roof is supported and steadied

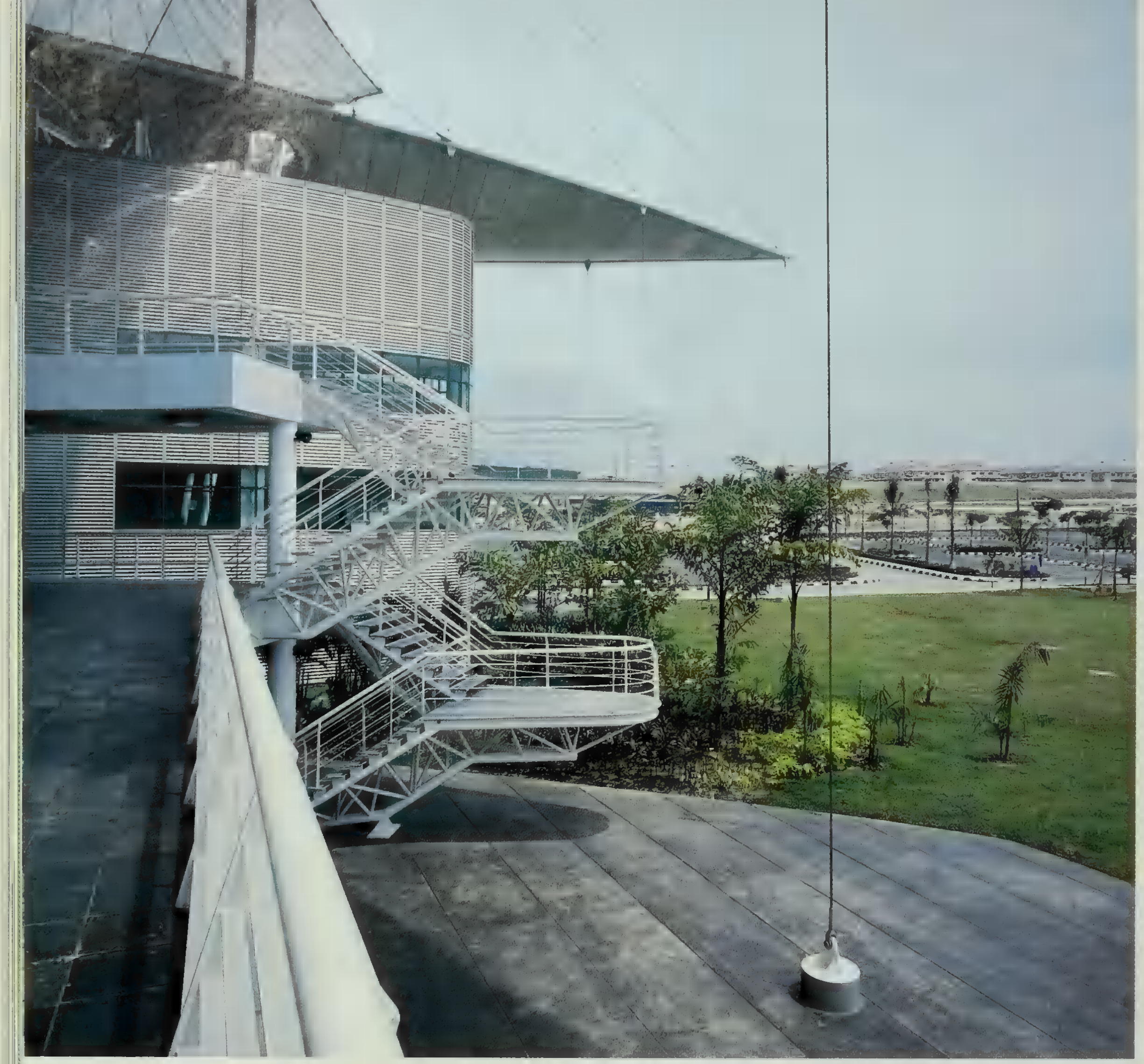
The roofs are suspended by galvanized-steel cables hung from three angled steel masts and are steadied by vertical stressing cables running from the ground and, in some places, from the building itself. The masts, which are actually bundles of three seamless-steel tubes manufactured in Japan and welded together in Malaysia, taper at the top and bottom. "In the original scheme there were more masts," says Ian Morris, one of the design architects in Yeang's firm. "But we wanted to simplify it to make it as elegant as possible."

While earthquakes were not a major concern in the design of the roofs (Kuala Lumpur is not in a severe seismic zone), high winds and typhoons were. The engineers for the canopy, the German firm IPL, along with Wacker & Rau wind engineers, conducted wind-tunnel tests of the roof to make sure it could withstand gusts of up to 115 feet per second.

The roofs were constructed about 120 miles from the site by a German contractor in 32 weeks, so work on the building and the protective canopy could proceed simultaneously. The roofs were then transported in pieces to the building site, where they were assembled and the pillows inflated.

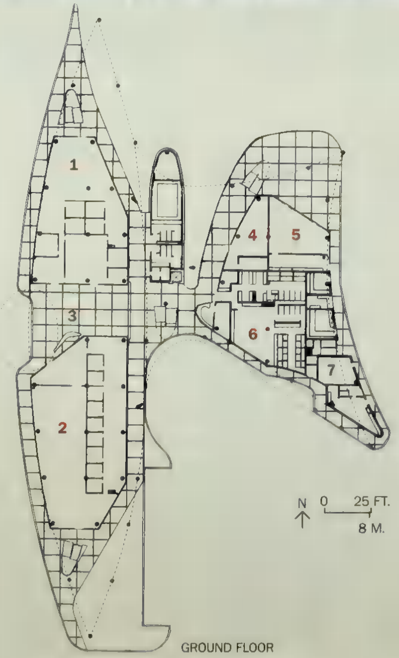
THE ROOF WAS DESIGNED AND TESTED TO WITHSTAND WINDS OF UP TO 115 FEET PER SECOND.

Though the Malaysian economy has been battered this past year following the collapse of the local currency, the Guthrie corporation has been buffered from the storm. Primarily an exporter of palm oil, it is paid mostly in foreign currencies. And while the price of foreign building products soared, that of local materials and labor went down. As a result, reports Yeang, construction of the Guthrie Pavilion and the surrounding development proceeded on schedule and on budget.

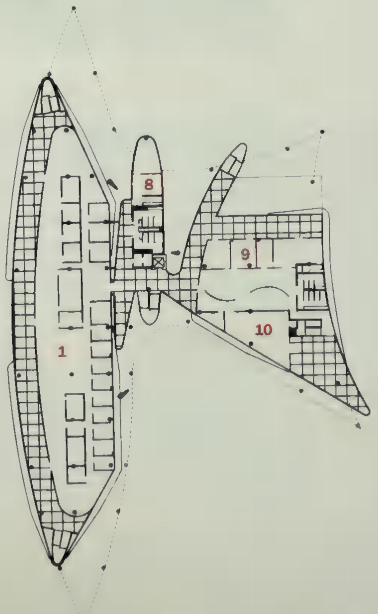


**Although earthquakes are not a major concern in Kuala Lumpur, typhoons and high winds are. As a result, wind-tunnel tests were done to make sure the suspended roof structure could withstand winds up to 115 feet per second. The building's masts, cables, and tubular metal railings give it a vaguely nautical look (left and opposite).**

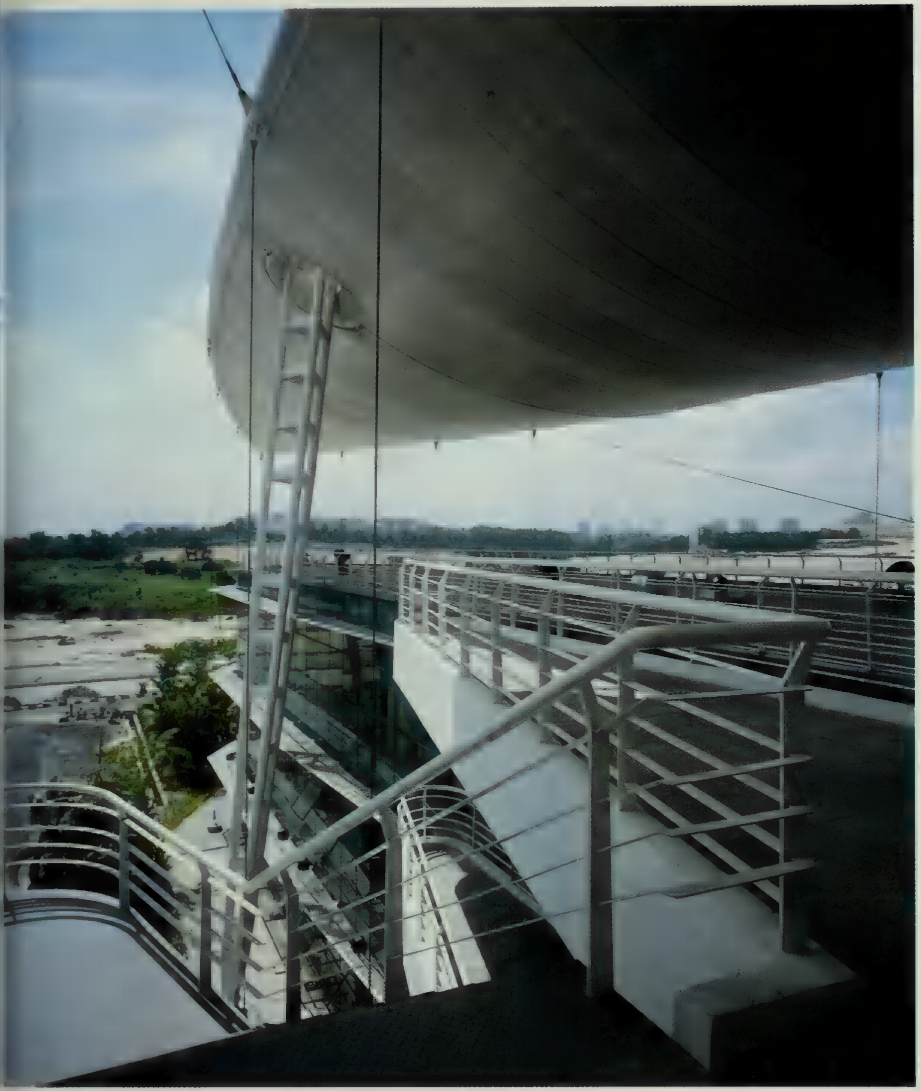
1. *Office*
2. *Office/exhibition*
3. *Reception*
4. *Pro shop*
5. *Cafeteria*
6. *Lockers*
7. *Caddy station*
8. *Prayer room*
9. *Executive office*
10. *Board room*

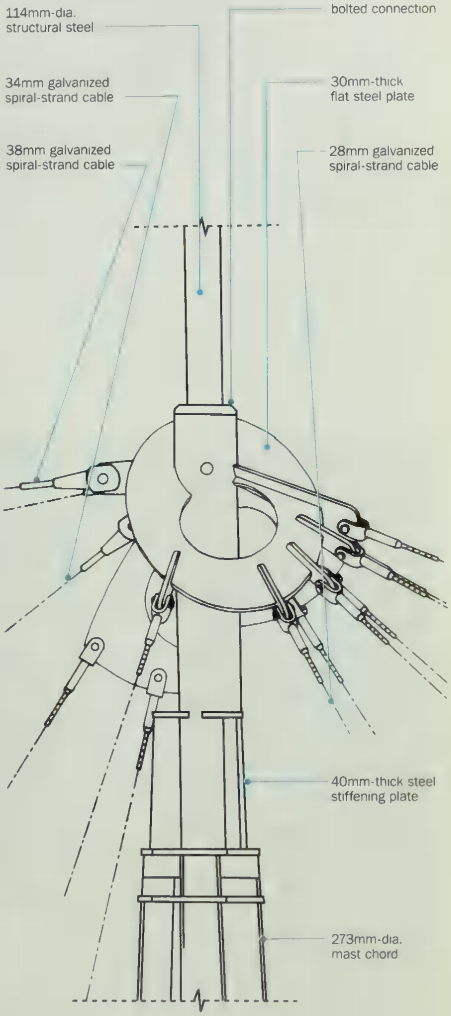


GROUND FLOOR



THIRD FLOOR




114mm-dia. structural steel
bolted connection
34mm galvanized spiral-strand cable
30mm-thick flat steel plate
38mm galvanized spiral-strand cable
28mm galvanized spiral-strand cable
40mm-thick steel stiffening plate
273mm-dia. mast chord

Completed in March, the pavilion has already become an attraction for groups of architecture students and even government officials. And while some members of the local architectural establishment shake their heads, says Yeang, others "think I'm a hell of a salesman to convince a client to do such a building." But the client loves the building, continues Yeang, seeing it as "his new toy." And why not? The toy is working fine, injecting excitement into what otherwise would have been a staid golf course development. With its inflated canopy lit up at night from below, the Guthrie Pavilion is a dynamic presence in the tropical landscape.

**THE INFLATED ROOFS ARE SUSPENDED FROM STEEL MASTS AND STEADIED BY VERTICAL STRESSING CABLES.**

Yeang's research for the Guthrie job has led him to further explorations of the uses of air in architecture. In recent projects, such as the 24-story UMNO Tower completed earlier this year in Penang, Malaysia, and a residential tower in Kuala Lumpur that is still on the boards, Yeang is investigating ways of using wind to reduce a building's mechanical loads. These projects incorporate "wing walls" that extend from the building envelope and direct wind inside, helping to cool interior spaces and increase fresh-air changes. He is also working on a residential tower in London, which will test his ability to adapt principles of bioclimatic design to a temperate region. ■

**Sources**

**Aluminum cladding:** *Pantech*
**Tempered float glass and anodized aluminum louvers:** *Malaysian Sheet Glass*
**Glass-fiber roofing:** *Flontex*
**Galvanized steel cables:** *Pfeiffer*
**Interior hardware:** *Newman Tonks*
**Acoustical ceilings:** *Daiken*
**Aluminum suspension grid:** *Donn*
**Paint:** *ICI*
**Plastic laminate surfaces:** *Formica*
**Carpet:** *Collins & Aikman*
**Office furniture:** *Haworth, Castelli*
**Entrance downlights:** *Erco*
**Exterior lights:** *Began, Sunlighting, Pluto, Hydrel*
**Elevator:** *Toshiba*

# In the KIASMA MUSEUM OF CONTEMPORARY ART, Steven Holl creates a dramatic embrace of Helsinki's treasured architectural legacy.

**by Karen D. Stein**

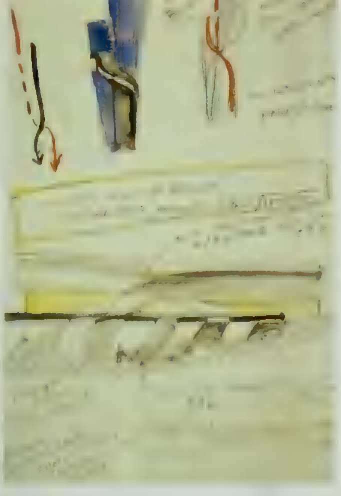
Steven Holl's design of the Museum of Contemporary Art in Helsinki was a long shot from the beginning. In 1992 the barely two-year-old institution, part of the Finnish National Gallery, decided to go out on its own. For its new home, it chose a hallowed site in the heart of the city at the foot of Töölö Bay. Situated between Alvar Aalto's Finlandia Hall, Eliel Saarinen's train station, and the behemoth neoclassical Parliament building, the open site was a centerpiece of a 1960s master plan by Finnish national treasure Aalto. His plan called, in part, for retaining conceptual if not actual sight lines to Lapland, the region above the Arctic Circle that is a scenographic touchstone of Finnish culture. Also to be respected was a statue of Finland's only nationally recognized war hero, Marshal Carl Mannerheim, on horseback.

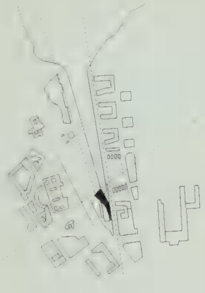
Grappling with these sacred spaces was one of the challenges of a museum design competition announced in September 1992. The competition included what its organizers, a group of city and state officials, called an "expanded Scandinavian" list of entrants. To promote good relations with neighboring nations, architectural firms in Latvia, Estonia, and Lithuania were encouraged to apply; and, perhaps as a metaphor for the institution's global ambitions, four international architects—Steven Holl of New York City, Coop Himmelblau of Vienna, Kazuo Shinohara of Tokyo, and Alvaro Siza of Porto, Portugal—were also invited to participate.

Of the 516 entries eventually received, 12 were disqualified for not meeting competition requirements. For those that did meet the requirements, Aalto's urban legacy proved so daunting that many local architects, who comprised the majority of entrants, were reticent to build

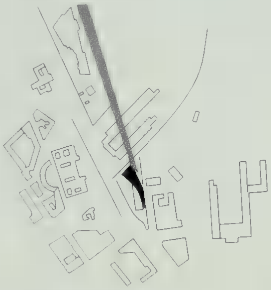
**Project:** *Kiasma Museum of Contemporary Art, Helsinki, Finland*
**Owner:** *Finnish Ministry of Education*
**Architect:** *Steven Holl Architects—Steven Holl, AIA, principal; Vesa Honkonen, project architect; Molly Blieden, Justin Rüssli, Tim Bade, Pablo Castro-Estévez, Janet Cross, Justin Korhammer, Anderson Lee, Chris McVoy, Anna Müller, Tomoaki Tanaka, project team*
**Associate Architect:** *Juhani Pallasmaa Architects—Juhani Pallasmaa, Timo Kiukkola, Seppo Mäntylä, Heikki Määttänen, Timo Ruusuvuori, Seppo Sivula, Meita Soini, project team*
**Engineers:** *Ove Arup & Partners—Guy Nordenson, Mahadev Ramen (structural/mechanical); Insinööritoimisto Matti Ollila & Co. (structural); Insinööritoimisto Olof Granlund (HVAC); Tauno Nissinen (electrical)*
**Consultants:** *L'Observatoire International (lighting); Teatek (theater)*
**General Contractor:** *Selcon*

PHOTOGRAPHY: © PAUL WARCHOL



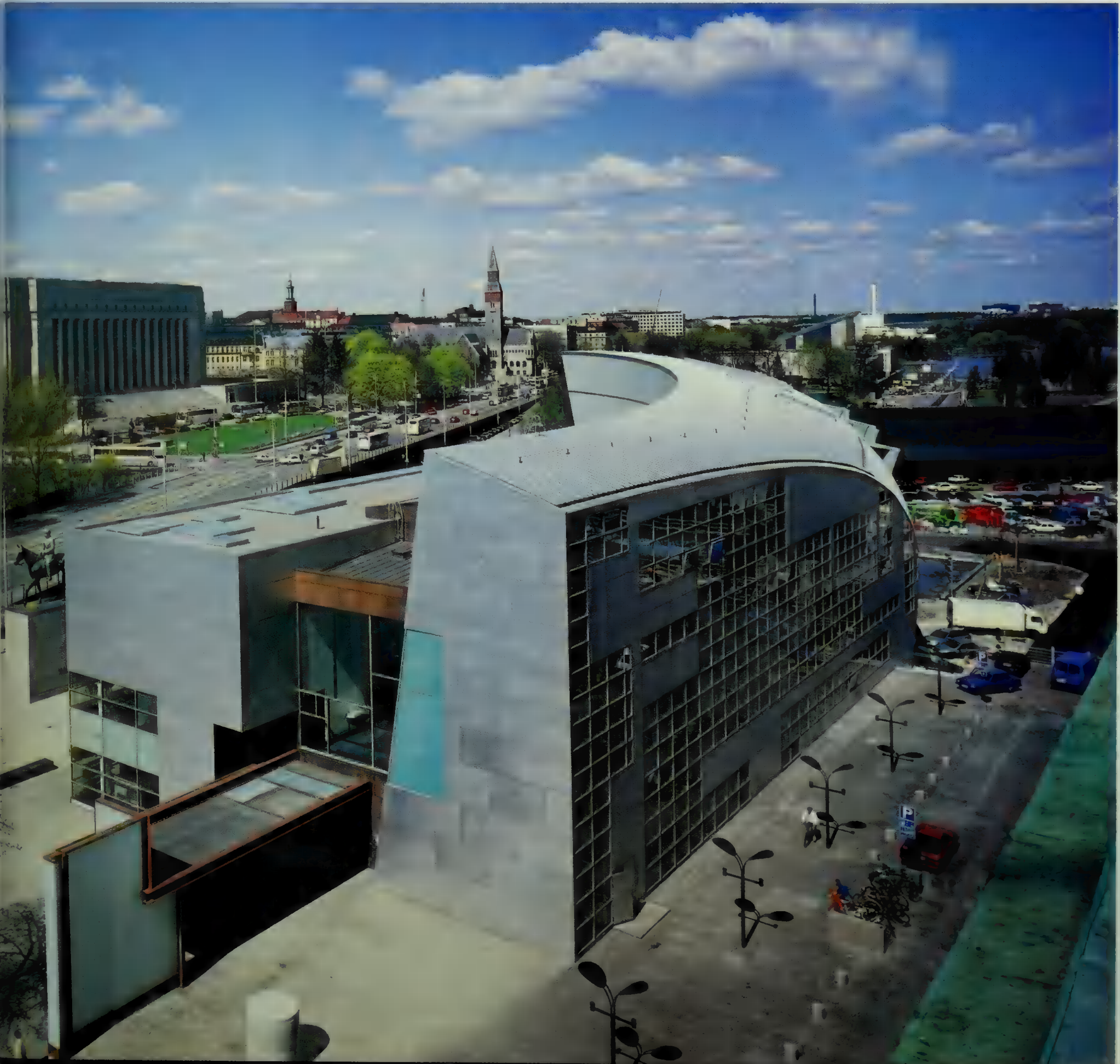


INTERTWINING
engage geometry of the city



MASTER PLAN
open sight lines

**Holl's sketch (far left) depicts the "intertwining" of the museum and civic monuments, including the neoclassical Parliament building (below). Diagrams (left) show how Kiasma engages the city's geometry and sight lines.**



stop what the master had designated as a seemingly endless view corridor. "In the Finnish entries the buildings were mostly underground," recalls Pekka Korpinen, deputy mayor of Helsinki and one of the competition jury members. "Aalto's open esplanade, which is meant to extend to the sea, is such an essential element of our city's architecture that Finnish architects couldn't solve the problem."

Holl, who submitted his anonymous entry under the code name "Chiasma," which means an intersection or a crossing over, won for a scheme whose fractured masses were designed to intertwine with the geometry of existing civic structures, and whose views correspond to Aalto's Lapland sight lines. The associate architect for the project, the respected local firm Juhani Pallasmaa Architects, provided critical insight early on in the project, says Holl, who had envisioned an outdoor courtyard as the design's centerpiece until Pallasmaa explained its inappropriateness to the often harsh Finnish climate.

**BURDENED BY AALTO'S LEGACY, FINNISH ARCHITECTS HAD TROUBLE SOLVING THE DESIGN PROBLEM.**

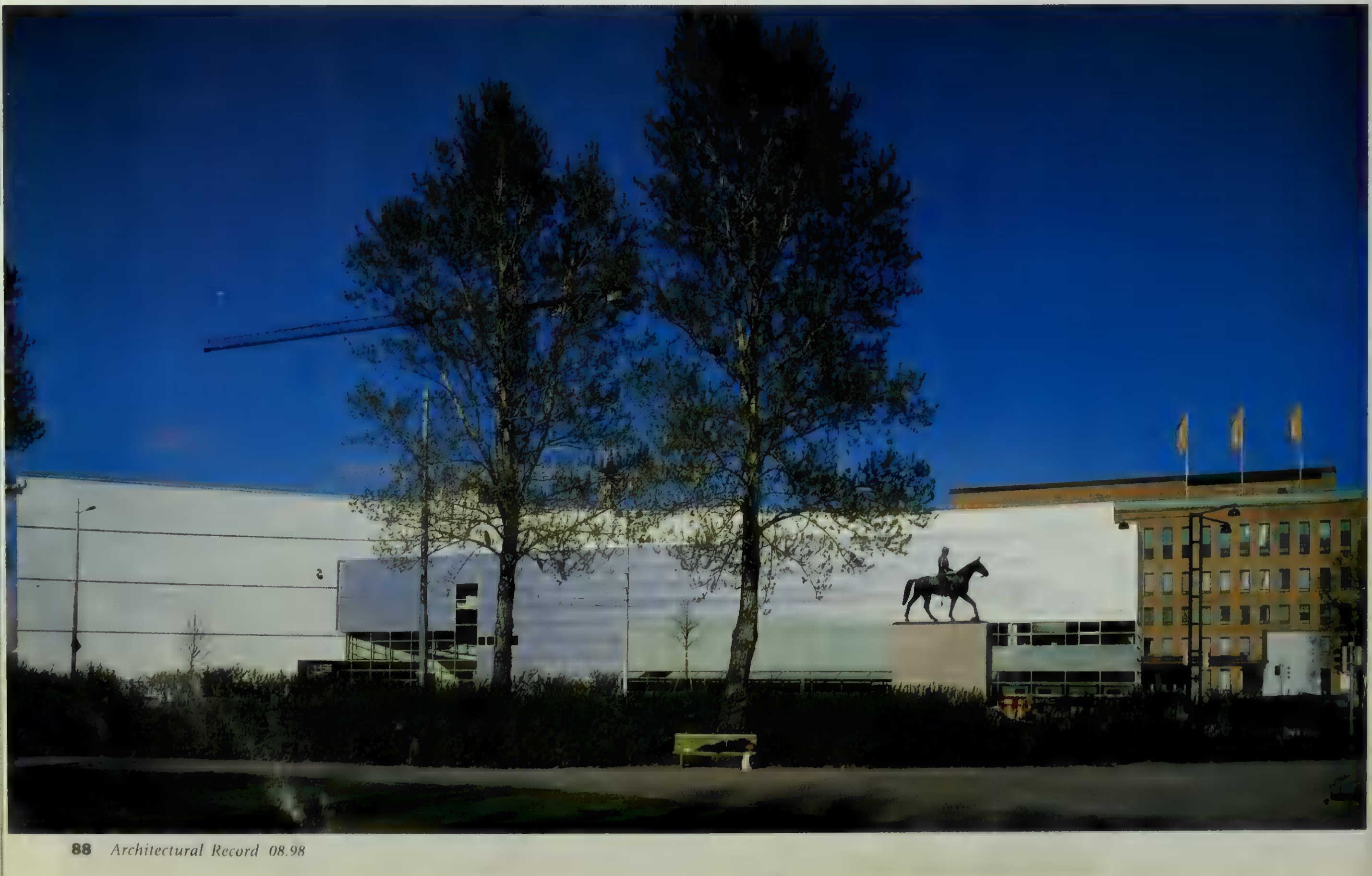
In its official announcement of the competition results, the jury called Holl's design of 25 interconnected galleries of different shapes and sizes "mysteriously sculpturesque." They praised in particular Holl's proposed "wall of ice," the west wall of glass that curved around the Mannerheim statue, which the architect moved 30 feet to the south, as if in gentle embrace.

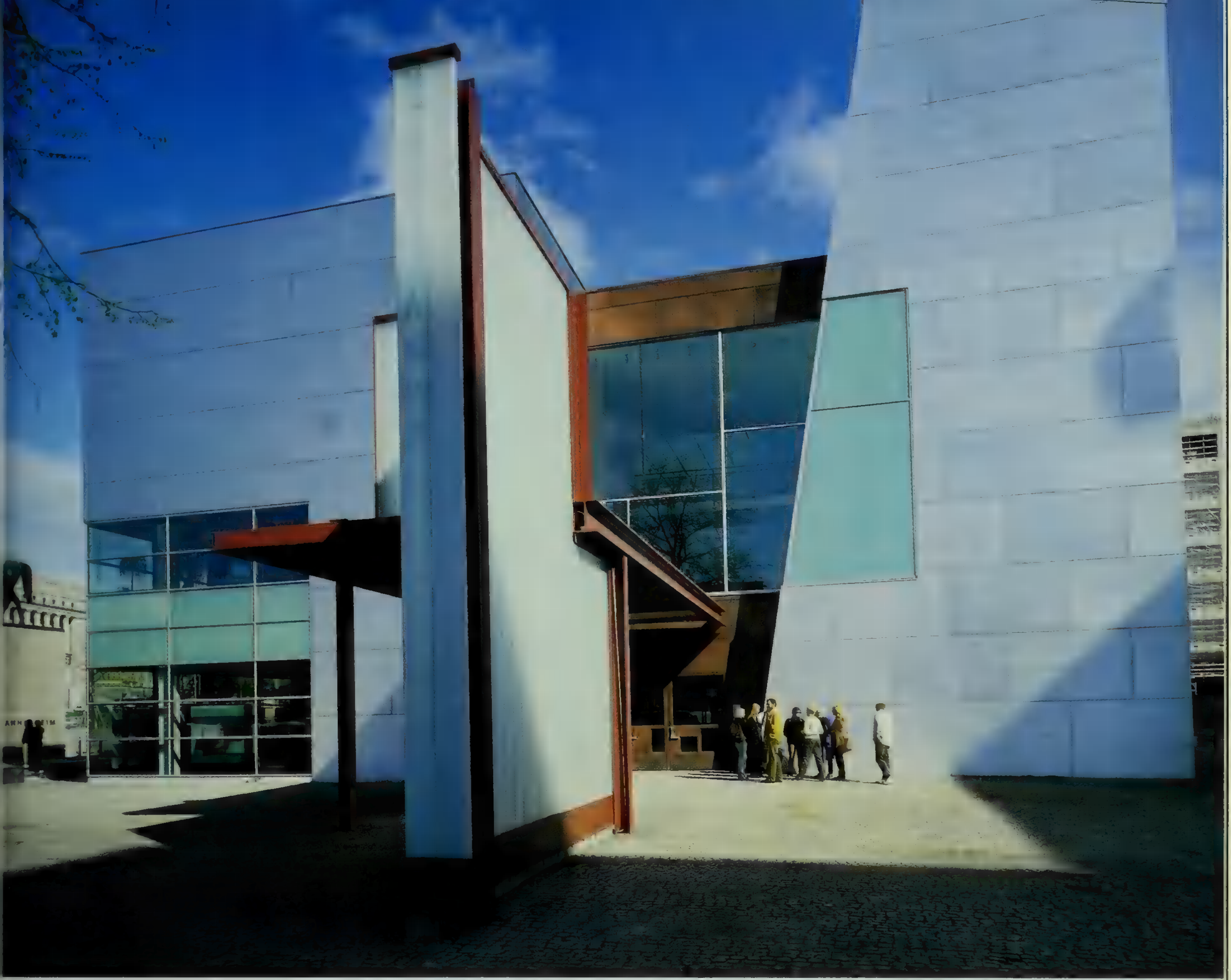
But the citizens of Helsinki offered Holl's plan no similar embrace. In fact, the public unveiling of the winning scheme was followed by a months-long campaign against the project led by veterans who opposed moving the Mannerheim statue. Some 22,000 people signed a petition for a referendum to prohibit the construction of the museum—quite an accomplishment in a country with a total population of just over five million. The design itself was also criticized, its rounded, hull-like zinc forms alternately likened to a nuclear submarine and a metal pumpkin. Nonetheless, the Helsinki city council voted against the referendum and, after a two-year delay, proceeded with the project. As a concession to public sentiment, however, the statue was left in its original location.

Now with the building complete, public opinion is dramatically changed. Not only has the debate about the site been put to rest, but the finished museum has become the Helsinki gathering point that one imagines Aalto planned for his esplanade: during the days-long dedication last May, it was overflowing with visitors. Christened Kiasma, a Finnish extrapolation of Holl's competition-entry code, the museum has, in fact, become an intersection of time and place.

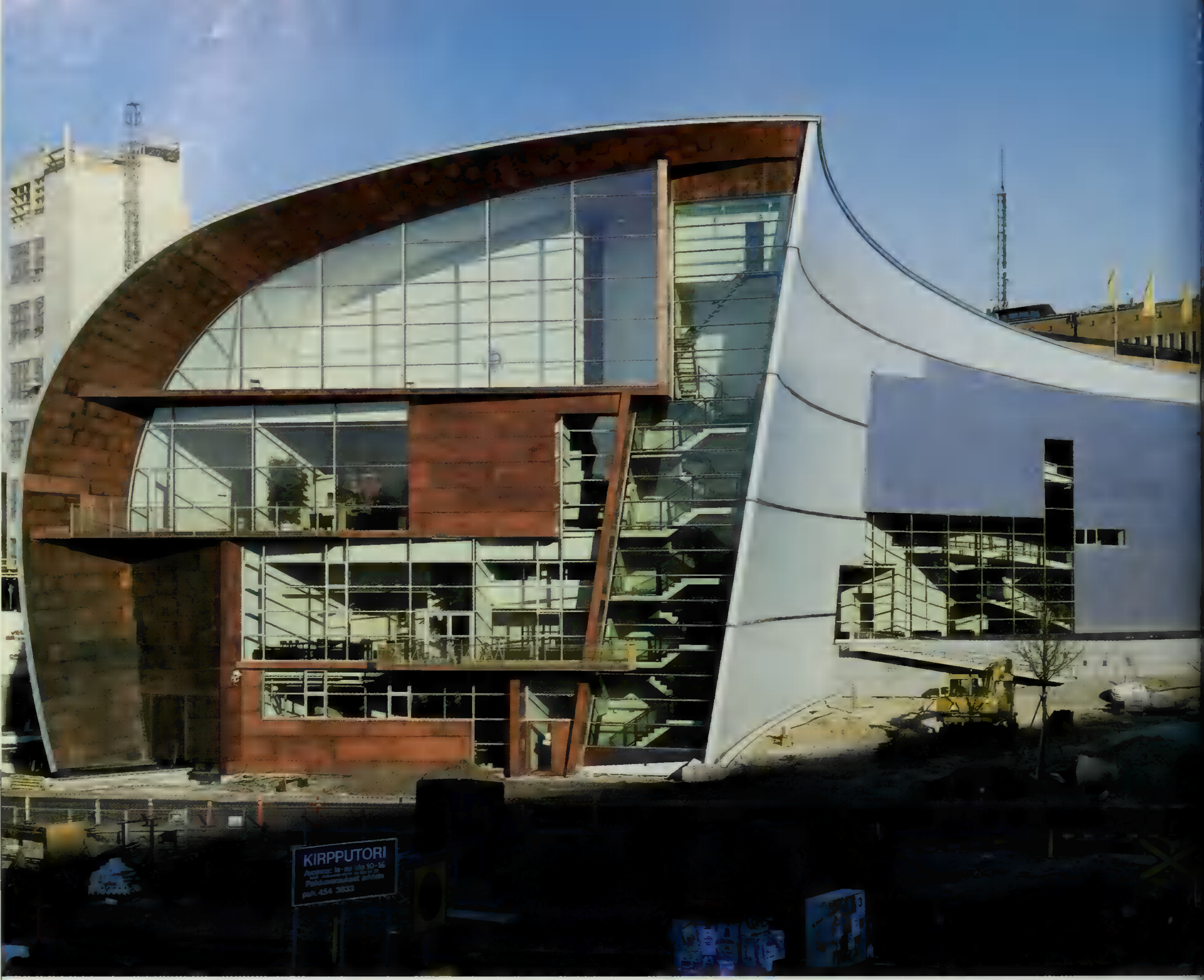
"It still somehow seems a miracle," confesses museum director Tulla Arkio, who has been involved with the project since its inception. "The discussions about the site and the Mannerheim statue have vanished." What's more, she says with a laugh, "'It's not so ugly, after all,' say the people who were against it."

For Holl, the controversy is less forgettable, if for no other reason than it jeopardized the realization of a project he has long considered his most important work to date. Interestingly, though, the





Holl describes the entry kiosk (above) as a sectional slice of the curved west facade's "wall of ice" (opposite). After much public debate, the statue of Marshal Mannerheim was left in its original position. Exterior cladding is aluminum panels and the vestibule is covered in a reddened brass to, says Holl, "make a dark moment of transition" from the perpetual summer light or snow-filled winter days.



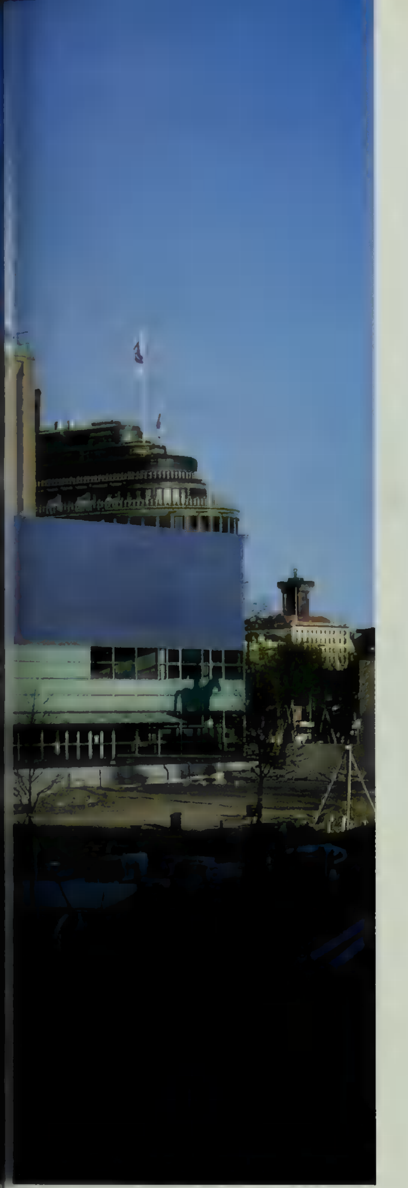
substantial changes made to the design after the competition were not prompted by the public debate. Those changes came during Holl's own development of the design, when, for example, he was asked to reduce the museum's size by 10,000 square feet to remain within budget. To do that, he literally shrunk the project by some 10 percent. "It was easy to do," explains Holl. "The drawings of the project were all on computer" and were scaled down accordingly.

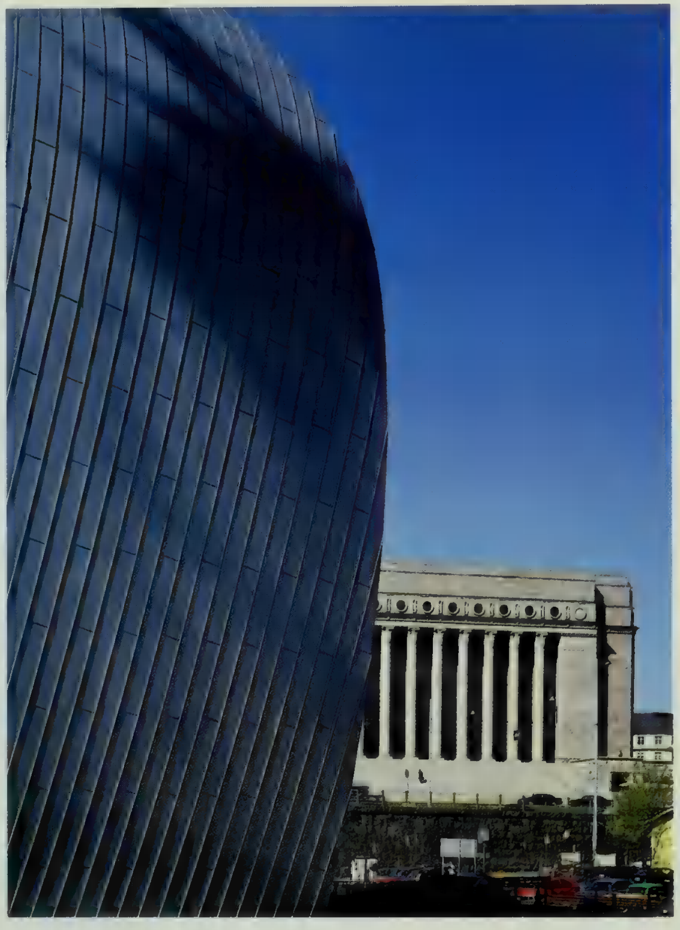
> **SUBSTANTIAL CHANGES MADE TO THE DESIGN AFTER THE COMPETITION WERE NOT PROMPTED BY THE PUBLIC DEBATE.**

Now measuring approximately 130,000 square feet, the museum cost $41 million, slightly below the budget. The project was funded by the city in return for the gift of the property, which had been owned by the national government, says Korpinen.

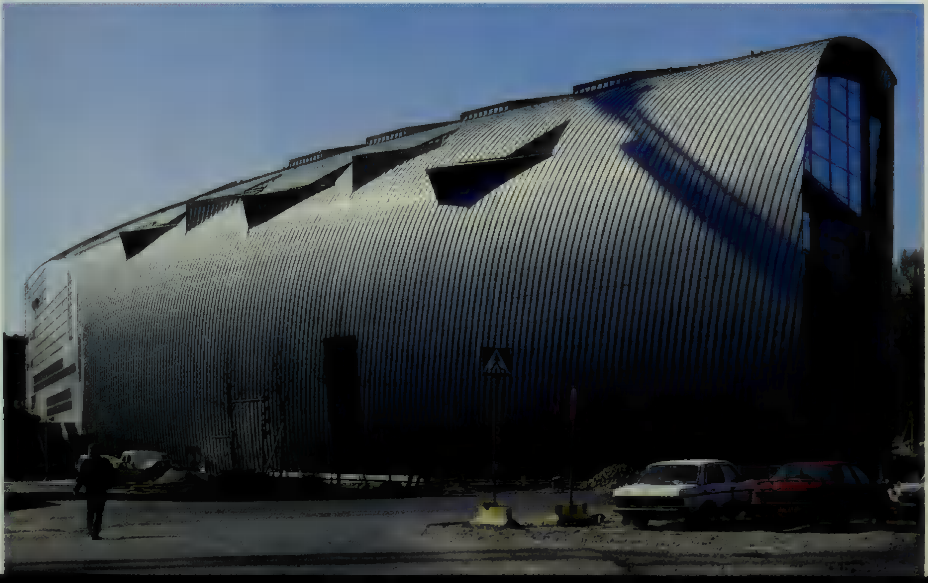
Other major changes occurred as construction systems and material selections were being developed. As depicted in the competition entry, the "wall of ice" was composed of overlapping sheets of glass. What Holl calls the "sketchy" nature of that aspect of the competition design was revised, partly because of the potential danger of fluttering panes. In addition, Holl and his team located an Austrian factory that made interlocking glass planks with a low ferrous oxide content, which diminishes the material's green cast and thus allows "as pure a natural light as possible," says Holl.

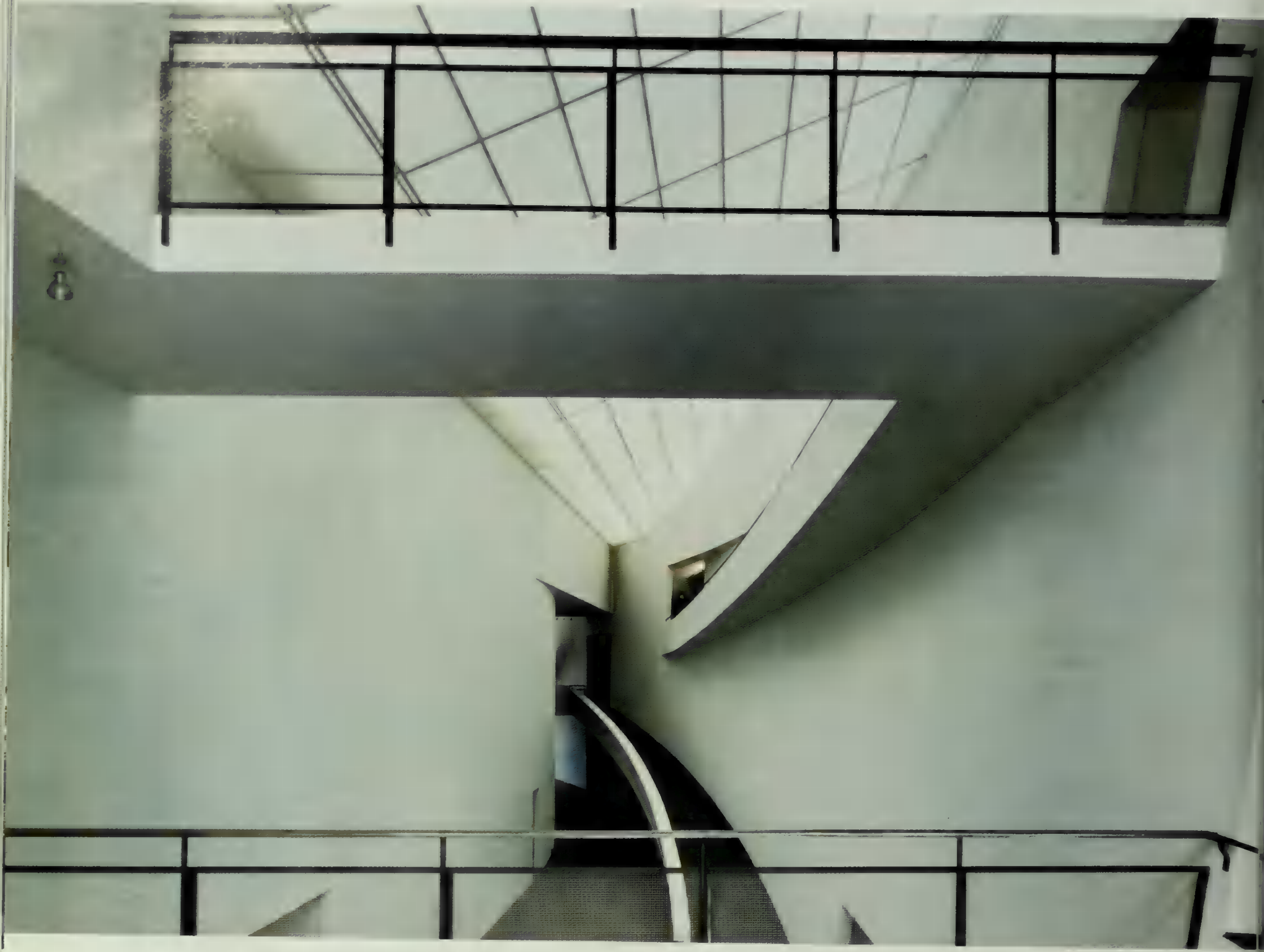
The most difficult technical challenge faced by Holl and his team was posed by the central spine of the museum: a 400-foot-long concrete wall that curves in two directions as it runs from the museum entry at the southern end of the site to the building's northernmost point. The first 200 feet of the wall lean eastward, starting out at an angle of 9.5 degrees and straightening at the wall's center point, which is marked by the elevator core. The second 200 feet gradually bend (*text continues*)

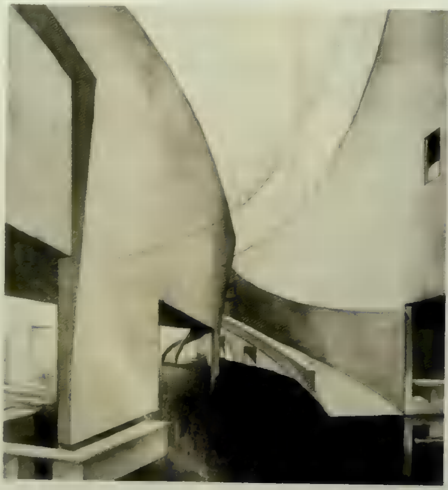




Skylights punctuate the zinc skin of the east facade (below), which offers a powerful contrast to the Parliament building across the street (above). At the museum's north corner, the glass wall leans 9.5 degrees westward (opposite).

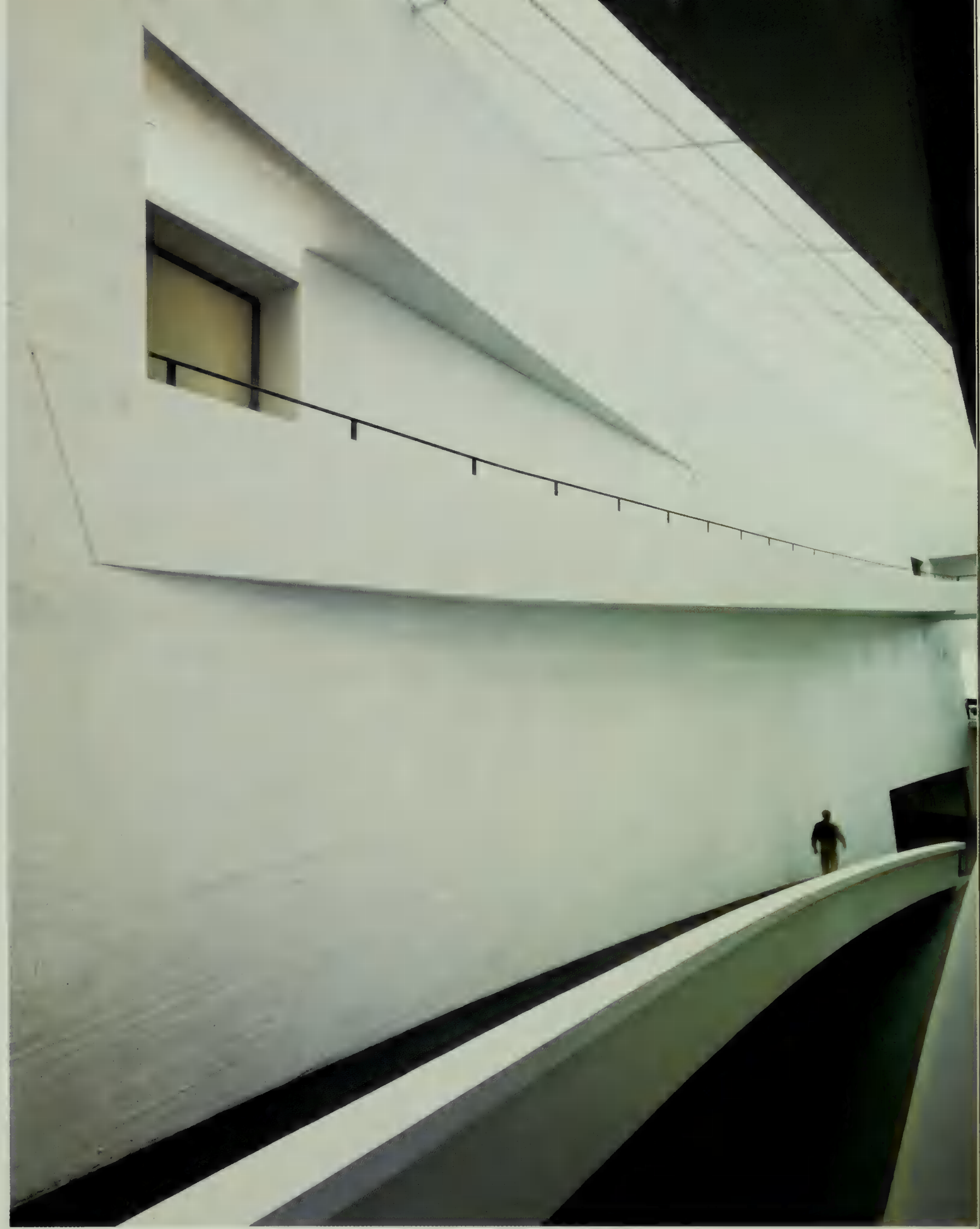




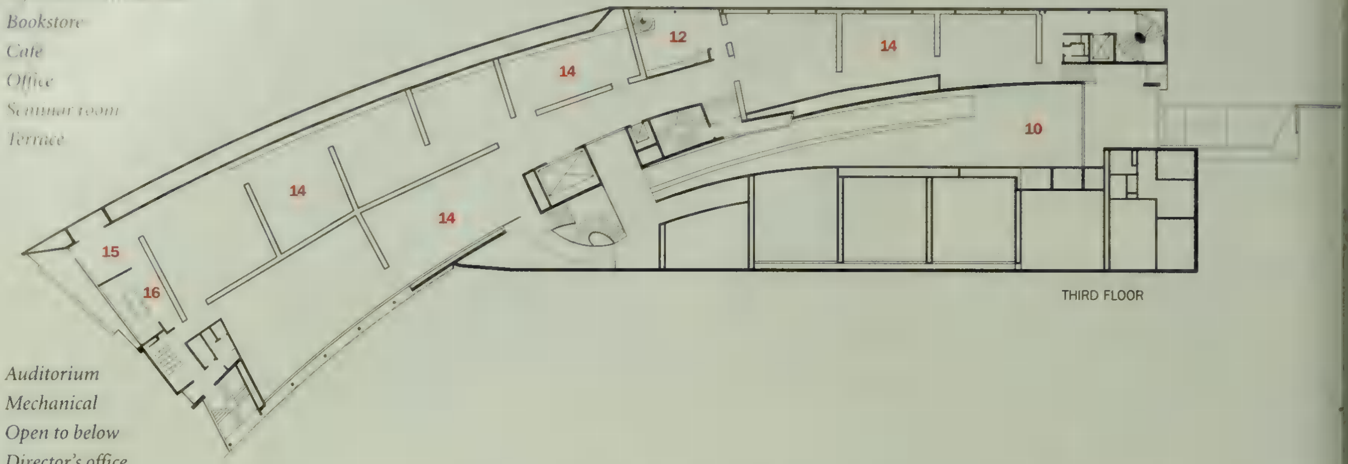


Holl's drawing of the project (left) resembles the completed project. For now, there are no plans to display art in the central atrium (above and right).

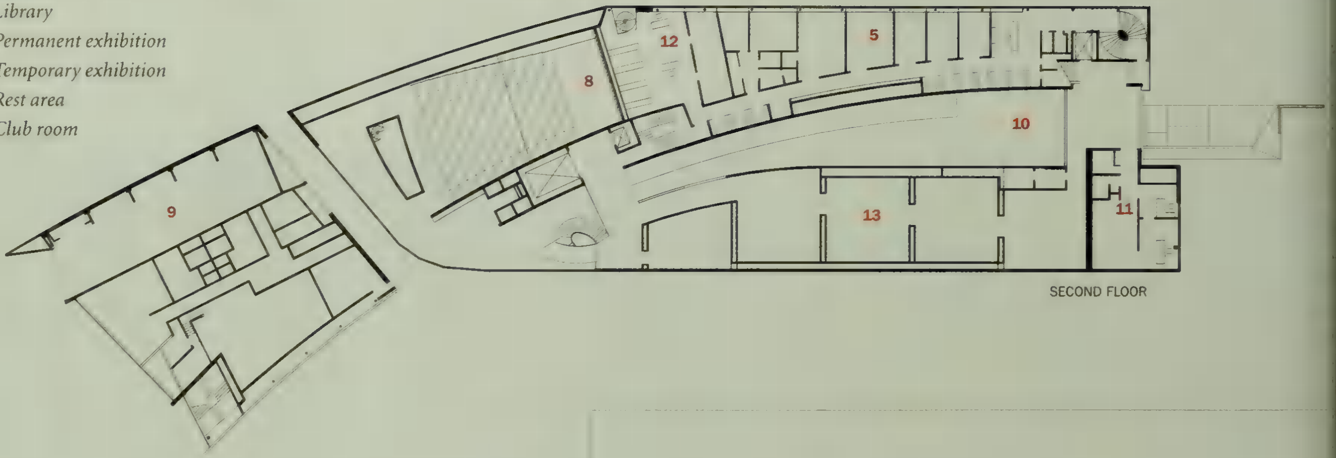
The central spine of the museum bears the horizontal lines of its construction process. In order to achieve the double curve along the 400-foot-length, the five levels of board-formed concrete were built successively. Skylights have sand-blasted glass. A ramp indicates the major circulation route through the galleries.



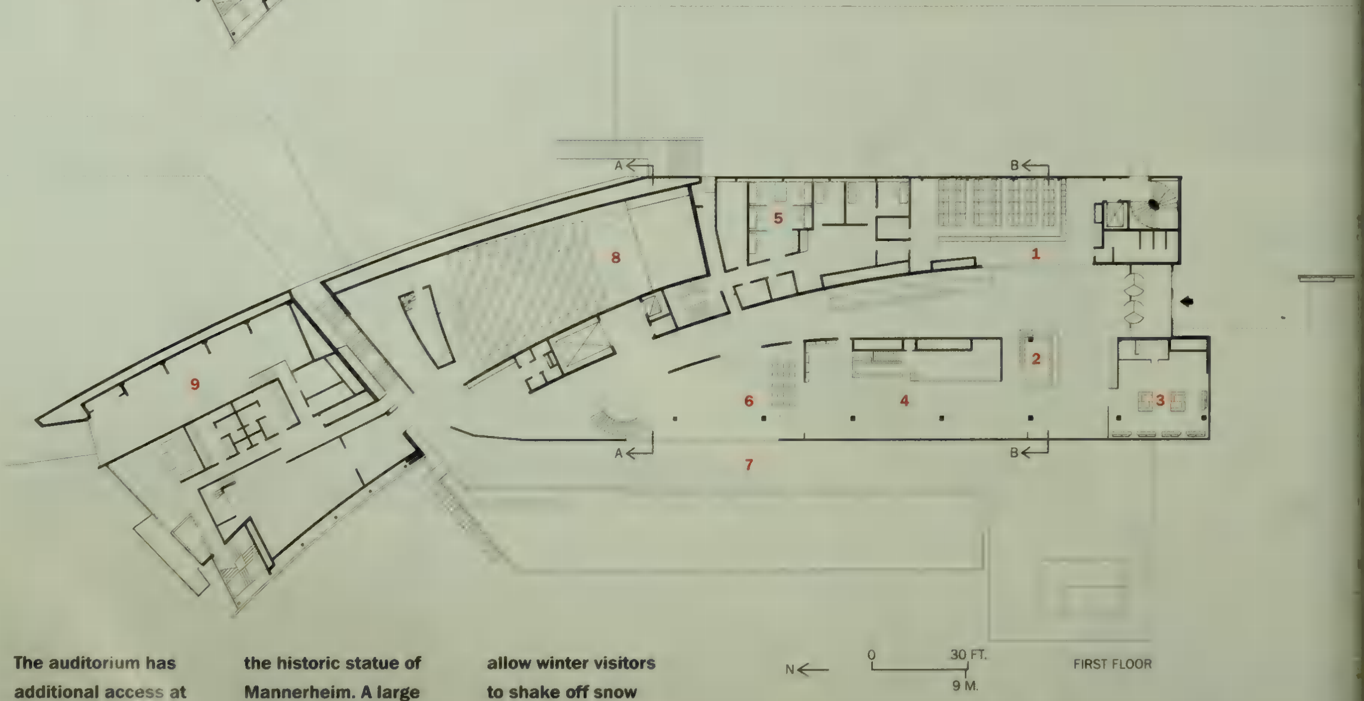
1. *Coat room*
2. *Information/ticket desk*
3. *Bookstore*
4. *Cafe*
5. *Office*
6. *Seminar room*
7. *Terrace*
8. *Auditorium*
9. *Mechanical*
10. *Open to below*
11. *Director's office*
12. *Library*
13. *Permanent exhibition*
14. *Temporary exhibition*
15. *Rest area*
16. *Club room*



THIRD FLOOR

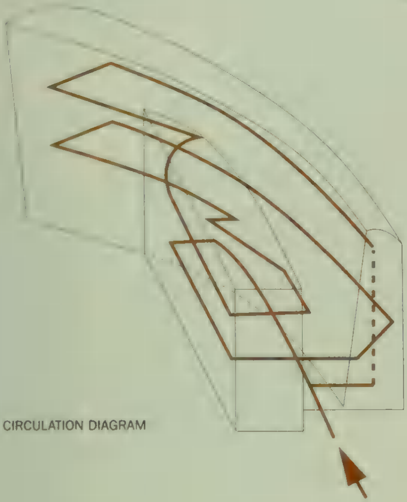


SECOND FLOOR

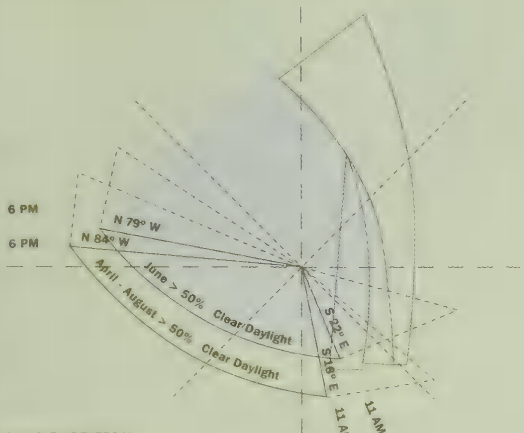


FIRST FLOOR

**The auditorium has additional access at the end of the terrace, which overlooks a reflecting pool and the historic statue of Mannerheim. A large main entry hall and exposed radiators in the auditorium foyer allow winter visitors to shake off snow and warm themselves before continuing their visit.**

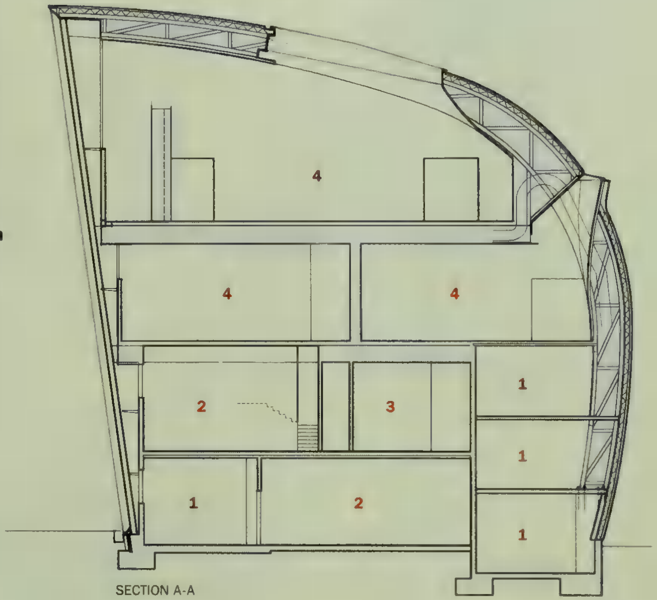


CIRCULATION DIAGRAM

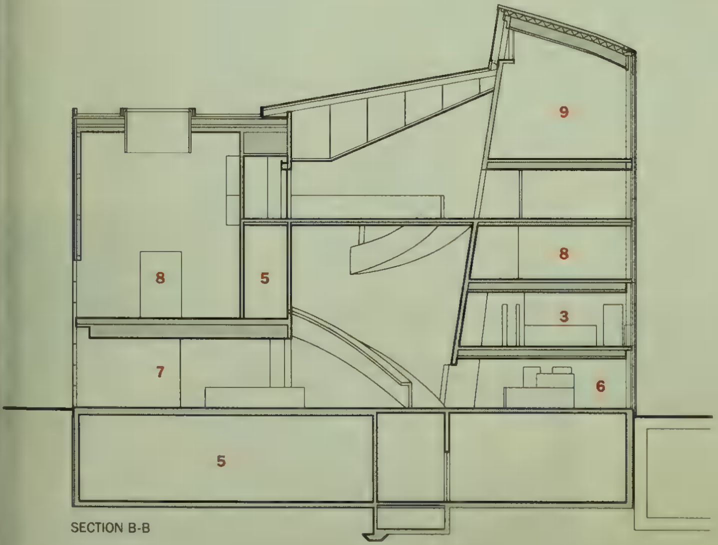

6 PM
6 PM
N 79° W
N 84° W
June > 50% Clear Daylight
April · August > 50% Clear Daylight
S 22° E
S 16° E
11 AM
11 AM

SUN PATH REVERSAL

**A central ramp connects the galleries (above left). Stairs and elevators provide additional access. The museum's curved form is designed to exploit the quantity and quality of daylight available at a latitude of 60 degrees north (above right). The curved building section captures the warm light of a horizontal sun, which is diffused by carefully placed windows (drawing below), according to the architect. The space between the outer steel truss and the galleries' inner skin is a return air plenum (drawing right).**

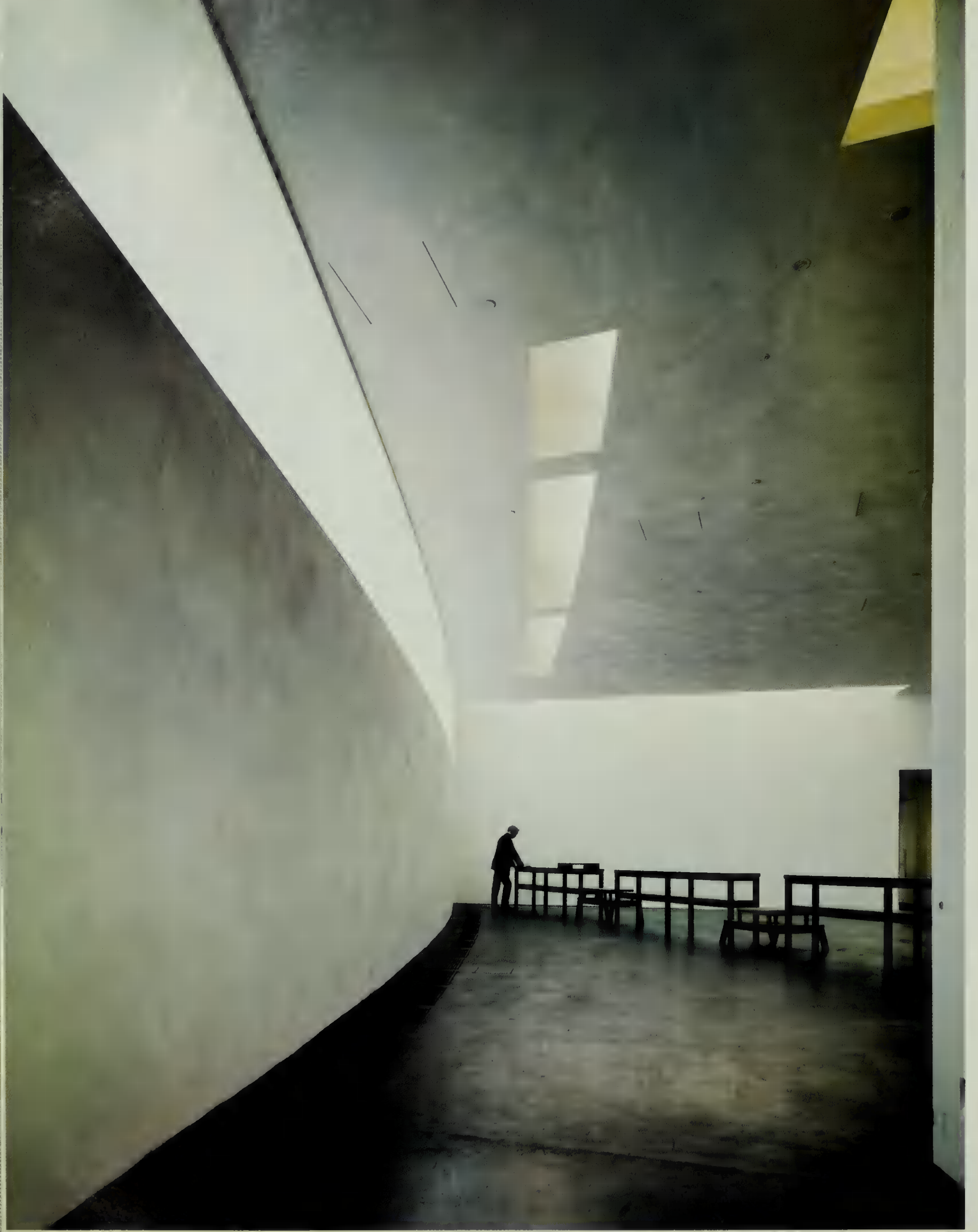


SECTION A-A



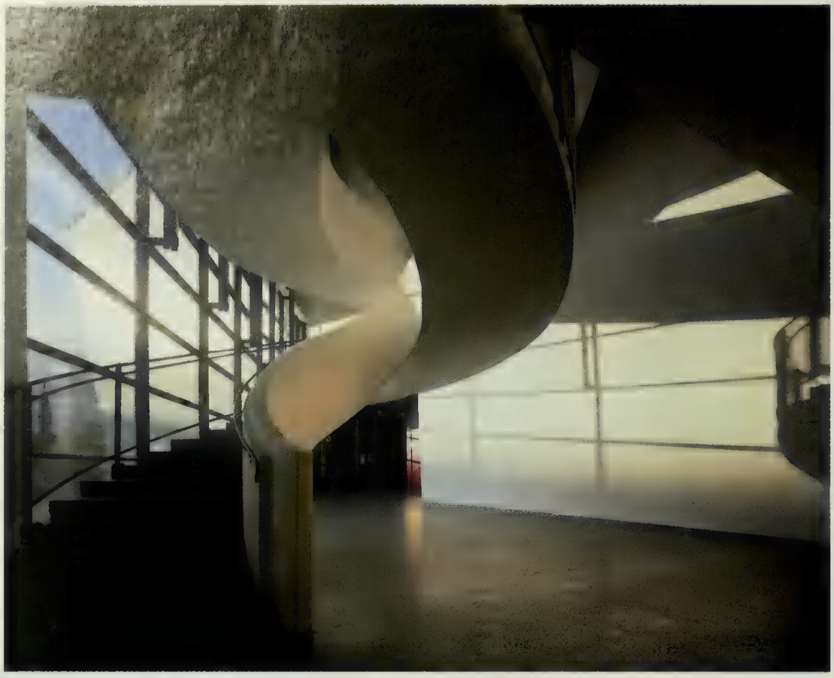
SECTION B-B

1. *Mechanical*
2. *Workshop*
3. *Staff facilities*
4. *Temporary exhibition*
5. *Art storage*
6. *Coat room*
7. *Information/ticket desk*
8. *Permanent exhibition*
9. *Workshop for children*

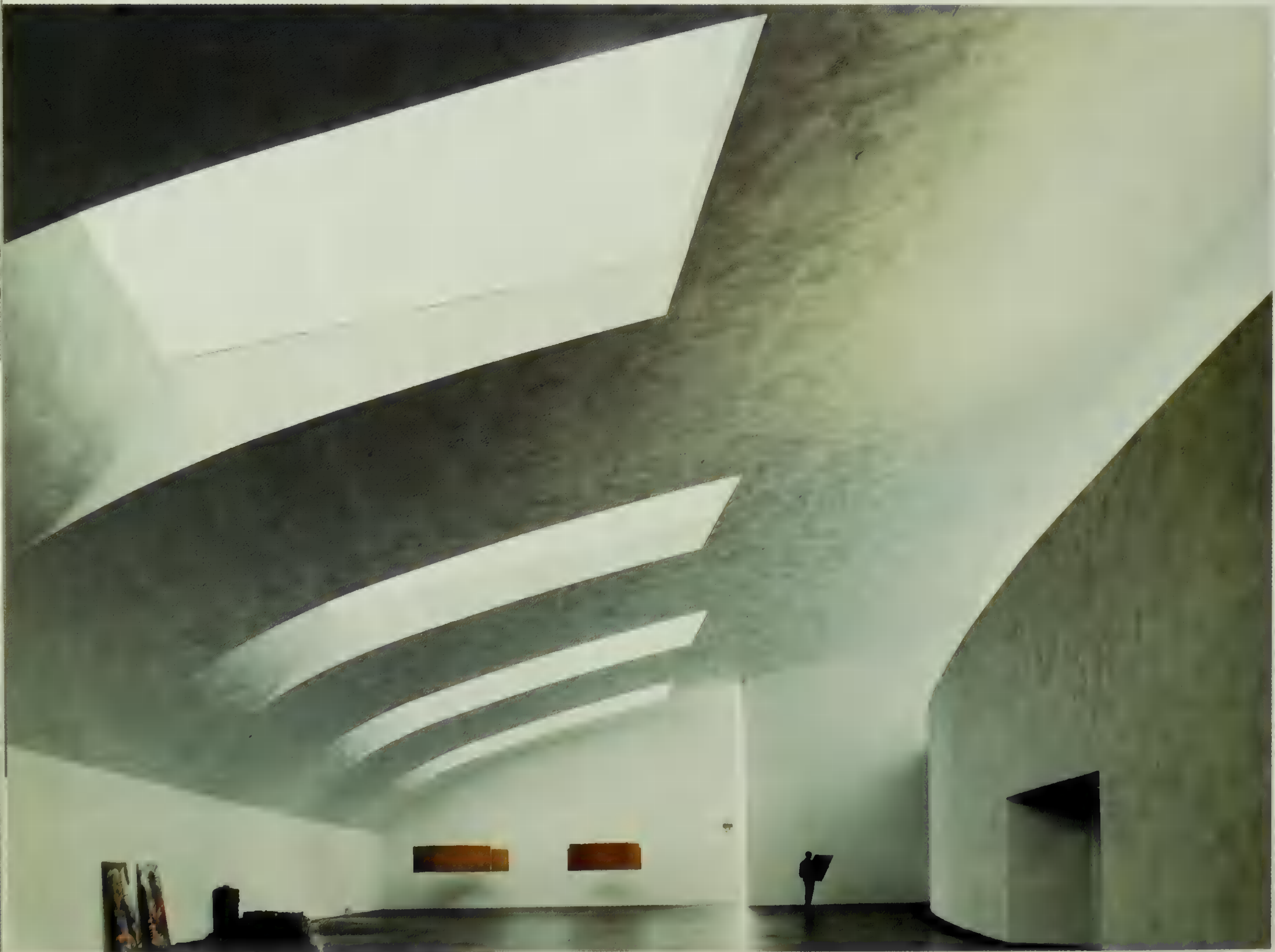


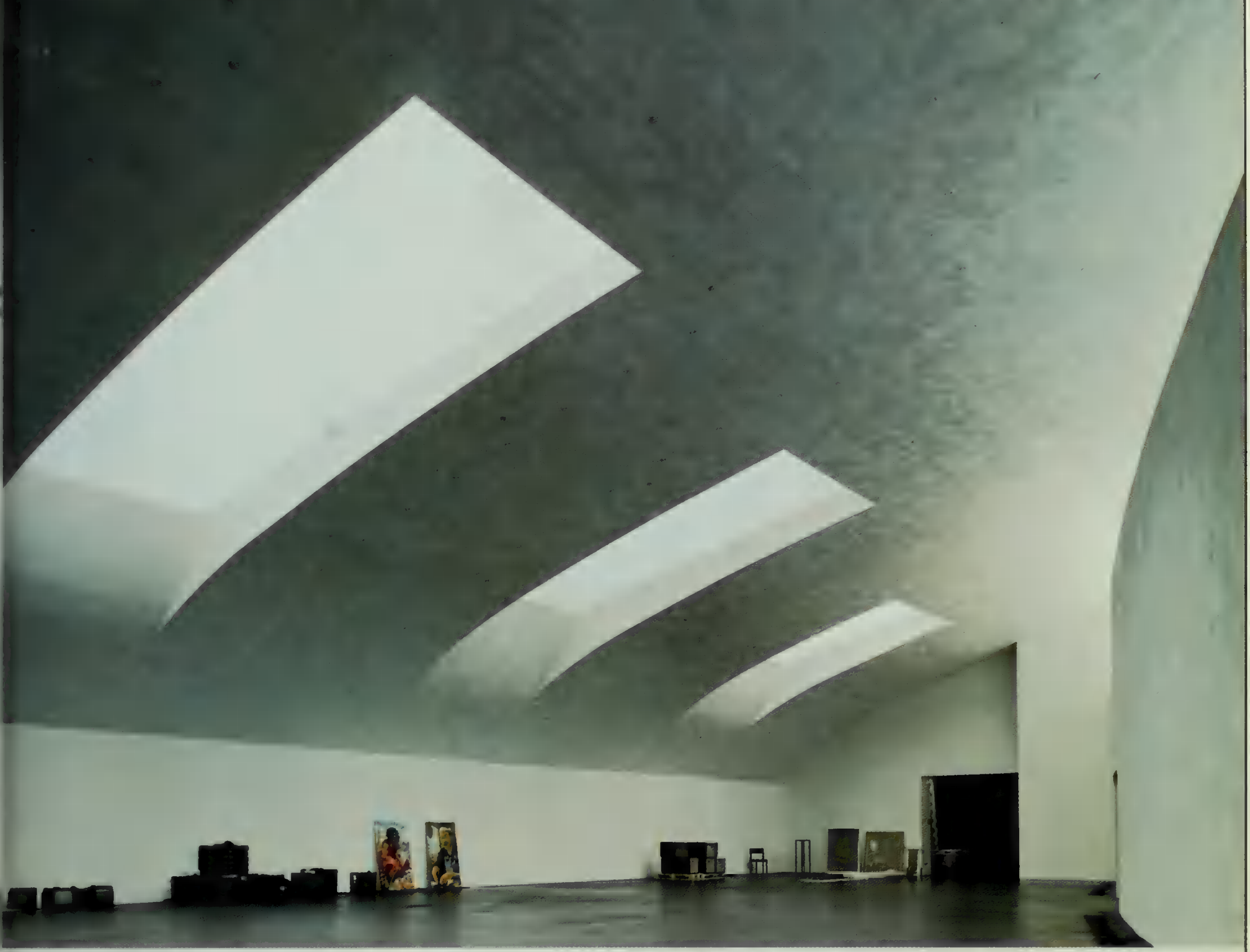
A telescoping series of openings between galleries enhances the elongated spatial effect of the plan (below). Among the 25 gallery spaces are rooms in a variety of sizes and shapes, allowing for a range of artwork (left and opposite). These photographs were taken in May, during the installation of the inaugural exhibition.

Bow-tie-shaped skylights bring daylight into upper-floor galleries (below).



**A curved staircase provides access near the auditorium (left and above). The fifth-floor gallery (below and opposite), the largest in the museum, is for temporary exhibitions.**





westward, to another 9.5-degree angle, explains Vesa Honkonen, Holl's Helsinki-based project architect. To avoid potential misalignment, the wall was built one level at a time, with a single story of wood formwork constructed atop each previous layer, allowing for shrinkage of the concrete as it dried.

According to Holl, the building was meant to be viewed not as a discrete object, but rather as a series of views and spatial experiences. "Contrary to how it was talked about, this building is really about partial urban views [from the outside and inside]. The excitement of this project is to see it in pieces," says Holl.

**THE BUILDING WAS NOT MEANT TO BE VIEWED AS A DISCRETE OBJECT, BUT AS A SERIES OF VIEWS AND SPACES.**

And if Holl wondered how his museum would be absorbed into the already rich architectural heritage of Finland, the question may have been partly answered even earlier than expected: four months before the museum's opening, he was awarded the Alvar Aalto Medal on what would have been Aalto's 100th birthday. "Modernism never lost its position in Finland," says Korpinen, describing the relationship between the two architects, generations apart, whose work now stands side by side. "Holl's building uses Modernism in a new way, but it is anchored in tradition, not in the latest fashion."

For Holl, inherent in the lessons of the Aalto legacy is a striking national attitude toward his profession. "Architects are very appreciated in Finland," explains Eva-Riitta Siitonen, Lord Mayor of Helsinki. "They have power." ■

**Sources**

**Aluminum siding, zinc and copper roofing:** *Peltisepänliike J. Huusok*

**Zinc roofing:** *H. J. Konito*

**Glazing:** *Lounais-Hämeen Iasipalvelu*

**Curtain-wall metal structure/ exterior doors:** *H. J. Tuominen*

**Concrete floors:** *Lattiavirines*

**Terrazzo floors:** *Suomen Massalattiat*

**Cast-aluminum objects:** *Jarmo Saarekas*

**Brass panels, steel railings:** *Levykaksikko*

**Custom light fixtures:** *Laaksonen & Poika, Valaisinpaja Idman*

**Cast-iron floor grilles:** *Metallivalimo Lahtinen*

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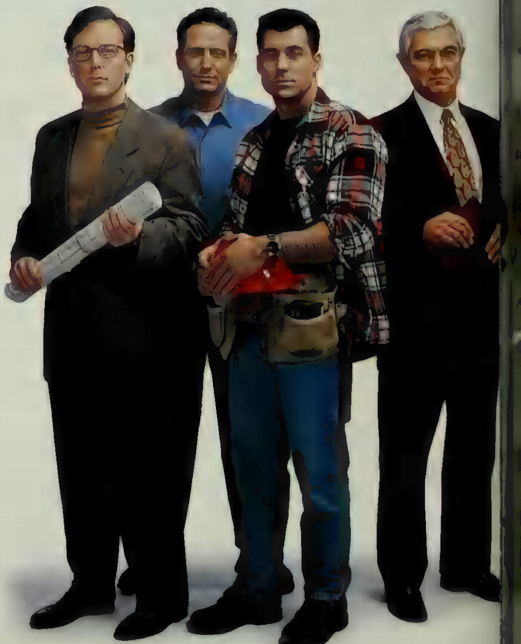

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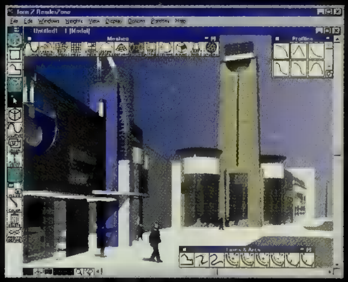

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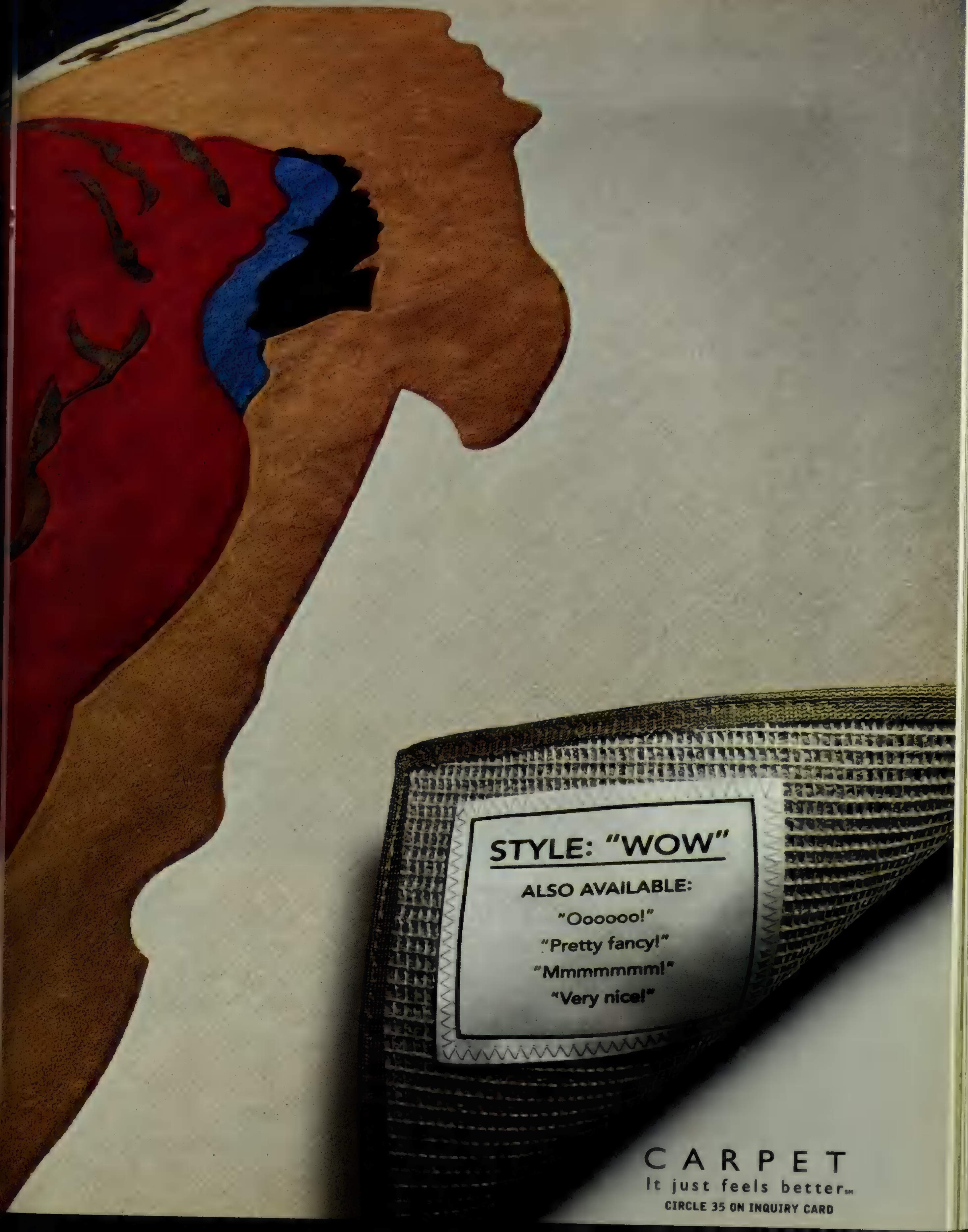

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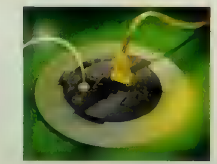

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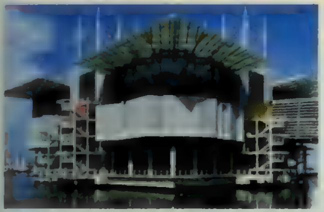
## ARTS AND LEISURE

# Taking Our Leisure

### SPACES THAT CREATE A VISCERAL RELATIONSHIP WITH THEIR VISITORS CAN FOSTER INTERACTION AND ENTERTAINMENT BASED ON THOUGHT, NOT SPECTACLE.

**by John E. Czarnecki**



1

**Lisbon, Portugal**

*Watching marine life is like watching music, thanks to Cambridge Seven's design, based on the idea that all of the world's oceans form one great sea.*

2

**New Brunswick, New Jersey**

*In revitalizing an old park and historic site, Parsons + Fernandez-Casteleiro creates structures that evoke the area's history while signaling its future.*

3

**Long Island City, New York**

*Across the river from Manhattan, Frederick Fisher + Partners redesigns an elementary school–turned–museum and creates galleries out of classrooms.*

4

**Elmhurst, Illinois**

*Moving a Mies house was the genesis for a community-based art museum by De Stefano + Partners that's inspired by the master's design philosophy.*

Innovative place-making encourages people to explore and participate in their surroundings. The most engaging buildings are those that invite us to take part on many levels, that stimulate all of our senses as well as our intellect. Interaction doesn't mean we have to be bombarded by smells, loud music, brilliant colors, or video monitors. Rather, the best places invite us to think and propel us beyond what we encounter in our daily routines. At their most basic level, the following projects—an aquarium, a park, an exhibition space, and a museum—are purely recreational. But what makes these buildings succeed is the visceral relationship they foster between people and place. These are not static structures; interaction is implicit.

Enveloped by the marine life around them, tourists are earthbound interlopers at the Oceans Pavilion in Lisbon, Portugal. The aquarium clearly belongs to the fish, who, thanks to the cleverly designed tanks, seem to be simply going about their business while we look on.

At Boyd Park in New Brunswick, New Jersey, bridges act as sutures; visitors crossing them actively take part in the process of bringing a city and its long-neglected waterfront together. Other gateways, nodes, paths, and landmarks in the park welcome an interplay between people and object, as well as between structure and nature.

P.S.1, a center for contemporary art in Long Island City, New York, is not so much an exhibition space as a treasure hunt, a search for the next art experience. Art may appear in a utility closet, in the back stairwell or a restroom, or even on the broad entrance steps of this renovated building. Here visitors are both observers and participants.

A visit to the Elmhurst Art Museum offers a different kind of experience. Born of an active and committed local arts community, this museum, which integrates Mies van der Rohe's McCormick House, offers a place for the community and visitors to view, create, and learn about art. Imagine hearing a lecture on Modernism while seated in the former living room of the Mies-designed house, or studying a complex sculpture with a view of that incredibly simple structure just across the courtyard.

Beyond interaction, a sense of history sets these projects apart—each has a multilayered origin and unfolding story. Aquarium, park, exhibition space, and museum were once industrial waterfront, canal, elementary school, and house, respectively. Through their evolving histories, each place gains a new relevance that inspires participation. ■

*John E. Czarnecki is a former editor of* Crit, *the AIAS national journal.*

## 1

# Oceans Pavilion Lisbon, Portugal

### FOUR VERY DIFFERENT TYPES OF SEA AND SHORE ENVIRONMENTS ARE GATHERED UNDER ONE ROOF IN THIS AQUARIUM.

by Robert Ivy

**Project:** *Oceans Pavilion, Lisbon, Portugal (future Oceanário de Lisboa)*
**Owner:** *Parque Expo '98*
**Architects:** *Cambridge Seven Associates—Peter Chermayeff, FAIA, design principal; Peter Sollogub, AIA, principal-in-charge; Bobby Poole, AIA, principal; Ginette Castro, AIA, project designer/site project architect; Chris Farley, AIA, non-living exhibits; Lauren Dewey Platt, exhibit coordination*
**Associate Architect:** *Promontório Arquitectos Associados—João Perloiro*
**Engineers:** *Ove Arup & Partners—Alistair Guthrie, director; FISIA Italimpianti—Gianfranco Bellotti, engineering manager*
**Design/build/start-up:** *IDEA/Engil: IDEA—Fred Wales, manager; Michael Oleksak, on-site project manager; Engil—Ismael Gaspar, director; António Croft de Moura, on-site project manager*
**Habitat builder:** *David L. Manwarren Corporation*
**Consultants:** *Chermayeff & Geismar Inc. (graphic design); Quentin Thomas Associates (lighting); Jardim Vista (landscaping)*

**Size:** *215,000 square feet; four-story exhibit and maintenance space; two-story access bridge; one-story support building*
**Cost:** *$70 million*

A single idea, that all of the world's oceans form one great sea, is the theme and unifying element of the Oceans Pavilion, a primary attraction at Portugal's world exposition, Expo '98. A huge, 1.22 million-gallon tank, 110 feet square and almost 22 feet deep, lies at the heart of the pavilion, informing the architecture and organizing the aquarium around a central concept: the interrelationship of global waters. This force coincides with the exposition's theme, "The Oceans: A Heritage for the Future."

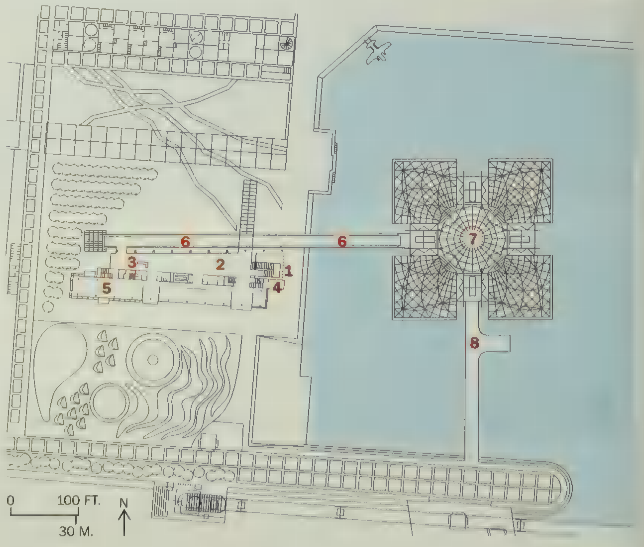
The new aquarium, Europe's largest, offers an emotional experience that's more theater than science. Peter Chermayeff, principal of Cambridge Seven Associates, which designed the aquarium, argues for the firm's approach. "The Oceans Pavilion may provoke controversy among those who will say this isn't a strictly scientific presentation. But we hope there will also be those who say, 'Yes, this is scientific. It makes a point about the unity of the Earth's oceans.'"

### The aquarium as theater

As in contemporary theater, the interior architecture is intended to disappear, focusing attention on the internal sea. The visitor experiences immersion into a blackened box, illuminated by undulating, watery light and, most memorably, by the continual face-to-face encounter with an array of marine life. The experience is heightened by scale and by sleight of hand: improvements in technology allow for invisible seams in the giant acrylic walls, some of which weigh as much as 16 tons. As a result, there's no sign of separation between tanks, allowing diagonal views across multiple stretches of water. The effect is a sense of unity and infinity; this small, contained bit of ocean seems to stretch beyond all sight.

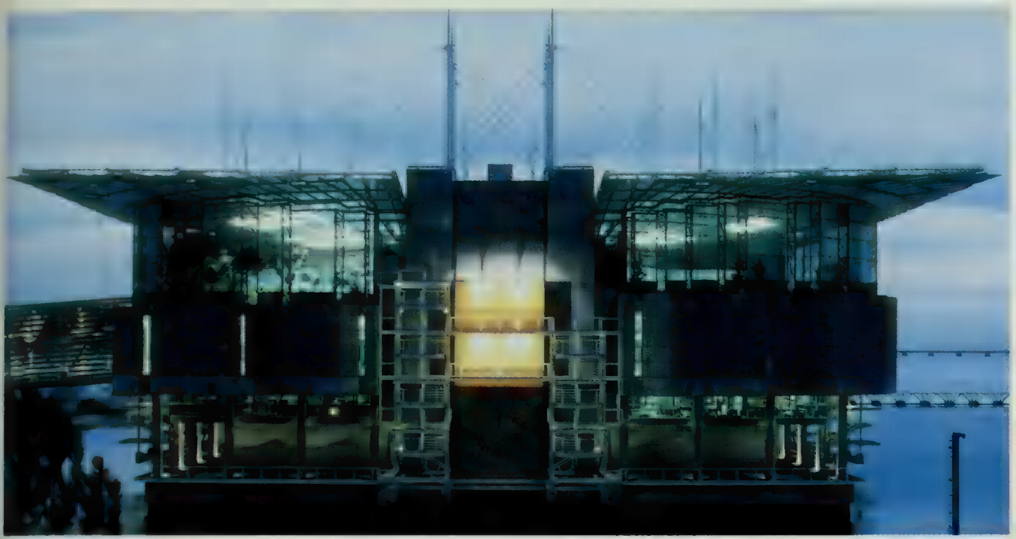
The main building, oriented to the compass points, rises on concrete piers above a protected basin known as Dock Olivais, where Pan American Clipper aircraft used to dock along the Tagus River. The building dominates its prominent location on the Expo's 150-acre site, a 3.1-mile stretch of reclaimed industrial property. The active exterior is made up of gray-green Portuguese stone and glazed walls, winding metal stairs, and a cantilevered, glass roof topped with trusses that resemble masts and rigging. The assembly suggests nautical or oil derrick analogies.

Visitors tour the aquarium building on a counterclockwise path.

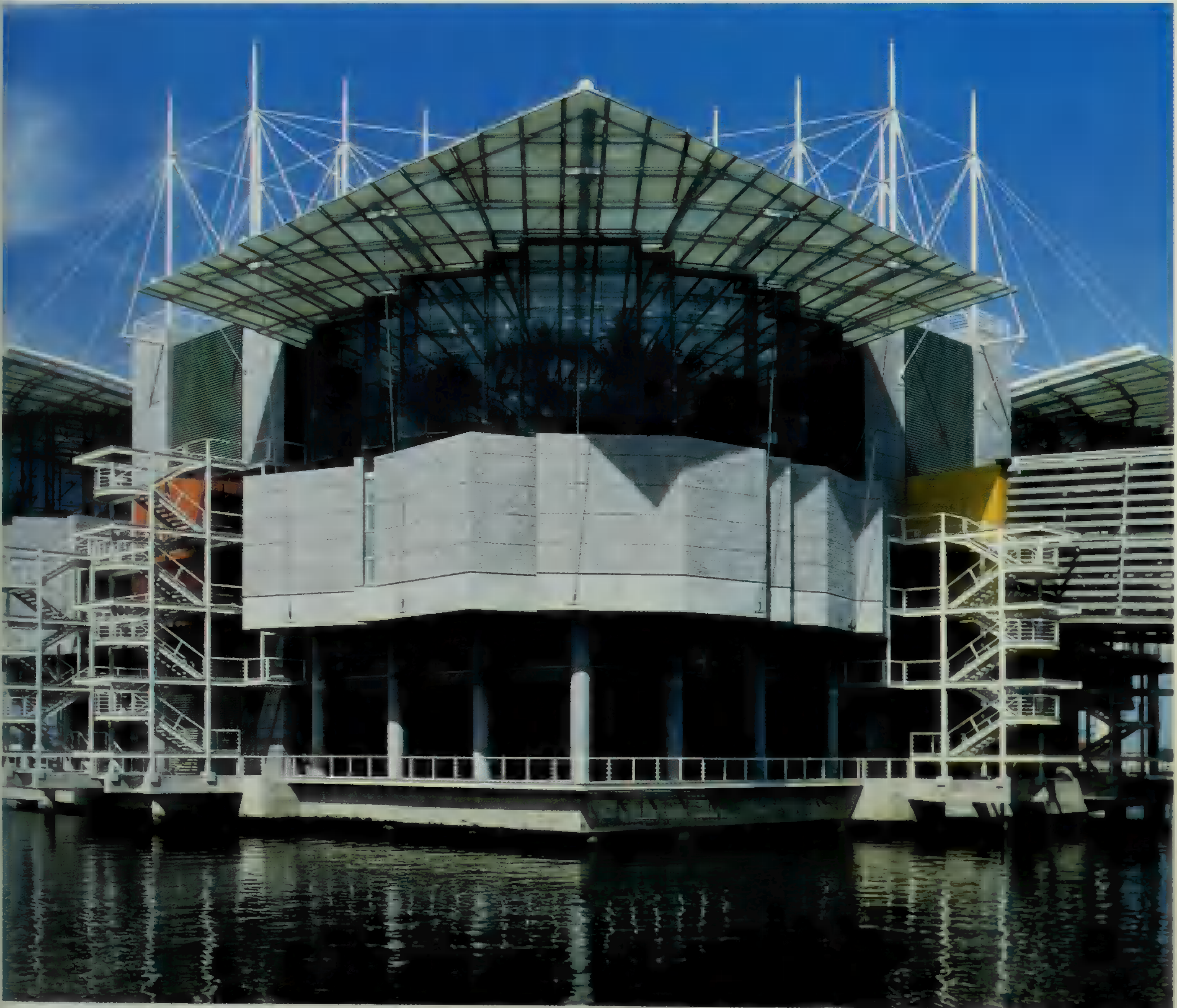


1. *Entry*
2. *Lobby*
3. *Ticketing*
4. *Conference room*
5. *Gallery*
6. *Bridge*
7. *Aquarium*
8. *Service bridge*

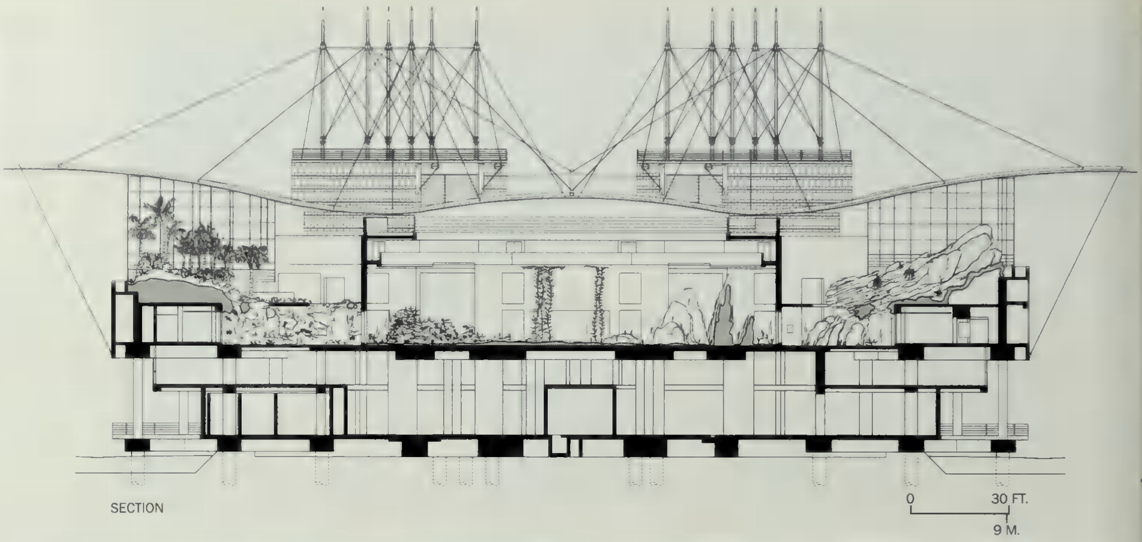
PHOTOGRAPHY: © HANS EGE, LUZERN



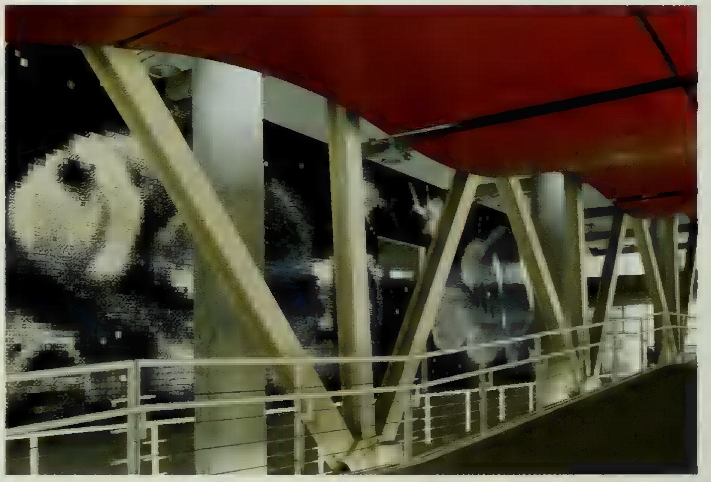
Rising from the waters just off the west bank of the Tagus River, the aquarium is the centerpiece of Expo '98, the final world's fair of the 20th century (left). The building, with its external truss system, stone walls, and metal stairways, resembles a ship or an oil derrick.



A cross section of the Oceans Pavilion shows the clear span provided by the external truss system. The topography of the ocean environments is also clear, with the shore structures tucked into the glass-roofed corners and the adjacent tanks.



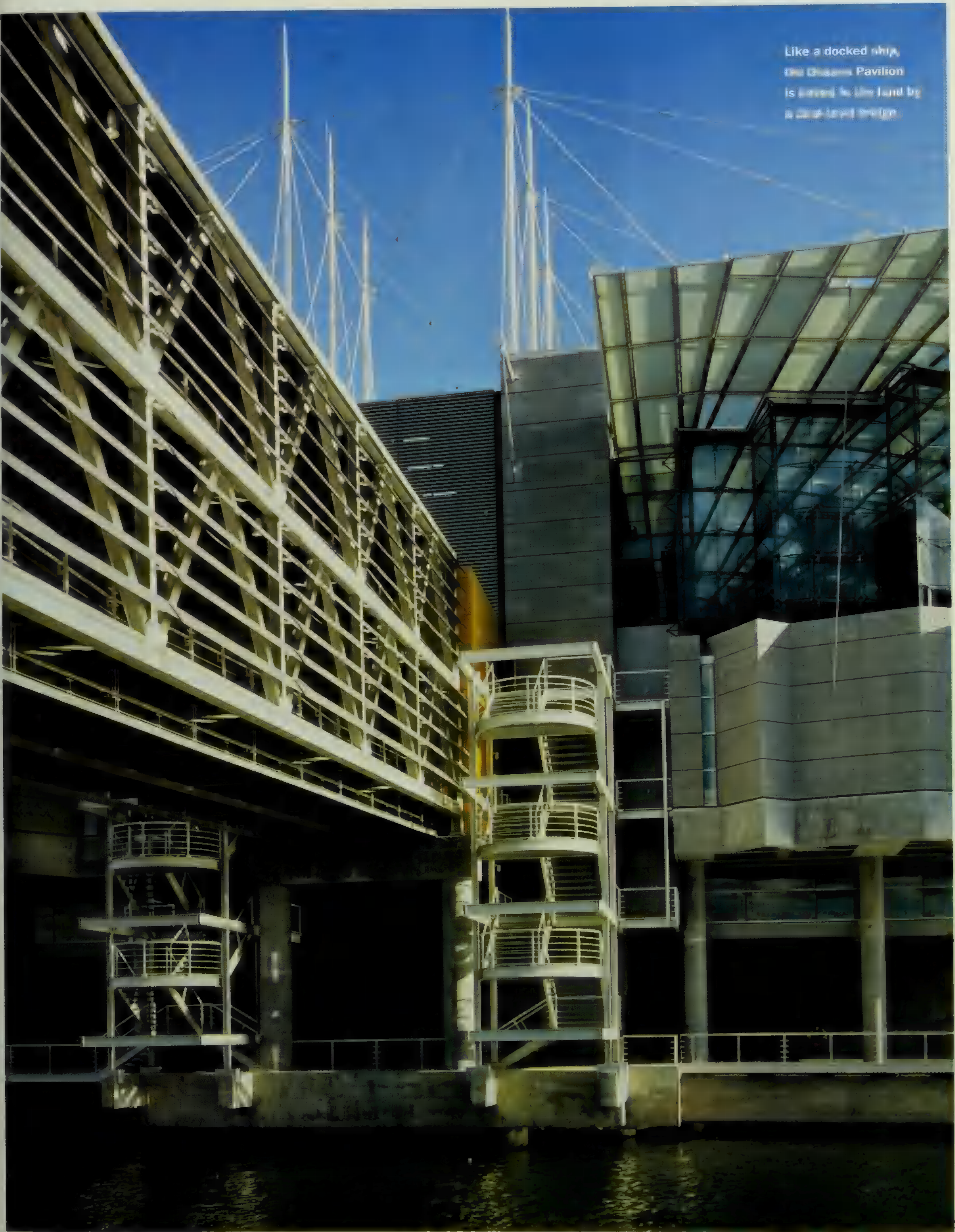
A two-level bridge (right) connects the aquarium and the support building, where tickets are sold and groups congregate. Along the wall of the support building is an intriguing mural made of blue and white Portuguese tile. Metal stairways wind up the sides of the aquarium (below). Glass roofs and glazing at the four corners admit daylight.



Though outsiders will see only two floors, the aquarium has four levels. A lower floor houses animal husbandry services and mechanical systems; the top floor gives the staff access to the tanks and the elaborate mechanical equipment required to sustain divergent, fragile life-support systems.

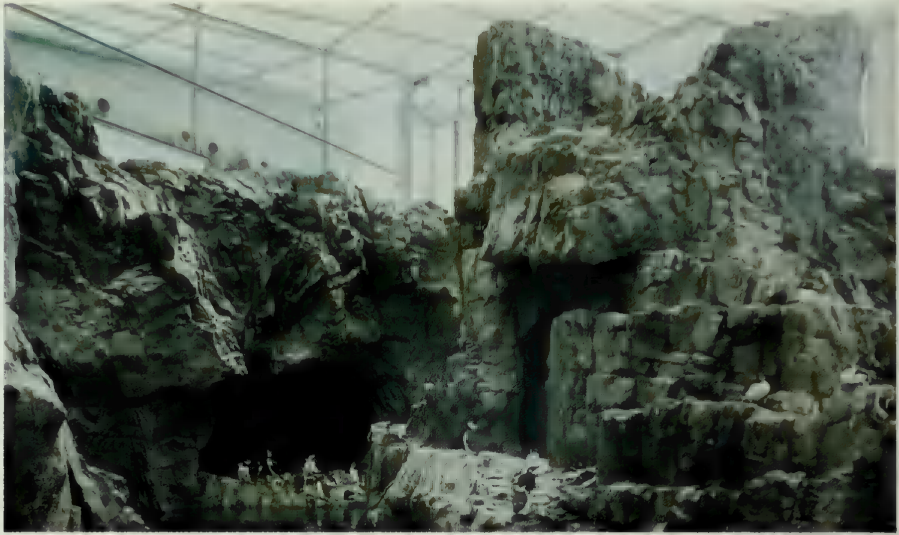
Passing the main tank on the upper level, tourists proceed into each of the building's four daylit corners, which combine terrestrial and marine habitats representing specific portions of the four major oceans: the North Atlantic near the British Isles, the Antarctic off the tip of South America, the Pacific near Monterey, California, and the Indian in the tropics east of Africa.

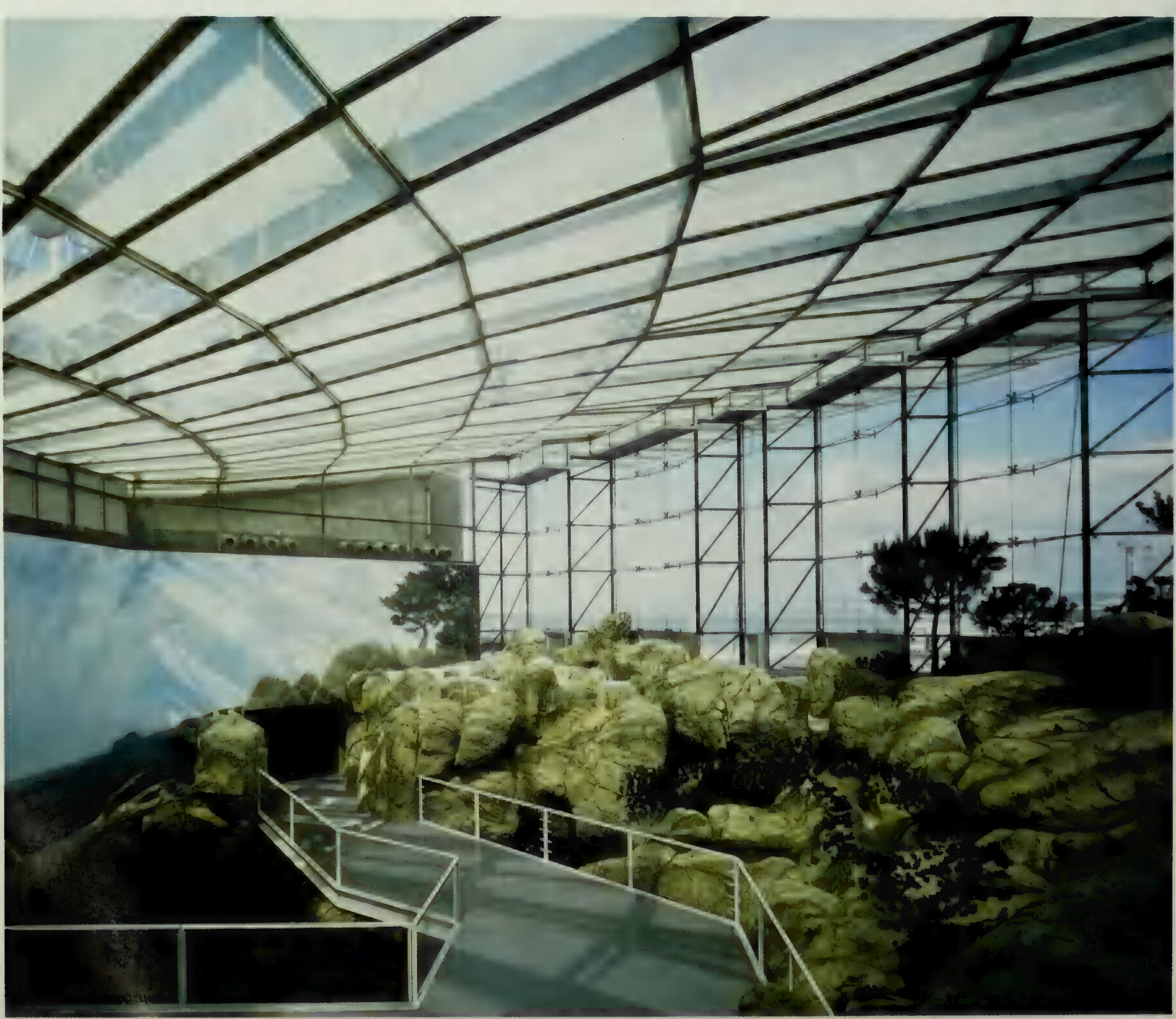
Light from the glass roof, which curves up at the corners, floods these end spaces. This gives visitors the impression that they are standing outside in some rarefied space as they watch the puffins, sea otters, razorbills, and penguins that occupy the corners sun themselves on rocks and then plunge into their pools. Fritted glass provides different light levels at each corner of the building. After a complete tour of the upper zone, the path drops one level to the ocean floor for submarine views of each of the four oceans, as well as the sharks, rays, sea turtles, mackerel, and other creatures in the main tank. Altogether, there are 8,000 specimens

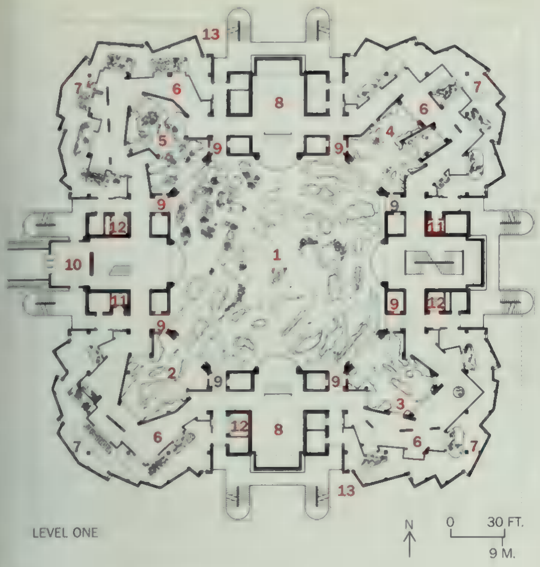


Like a docked ship, the Oceans Pavilion is linked to the land by a [illegible]-level bridge.

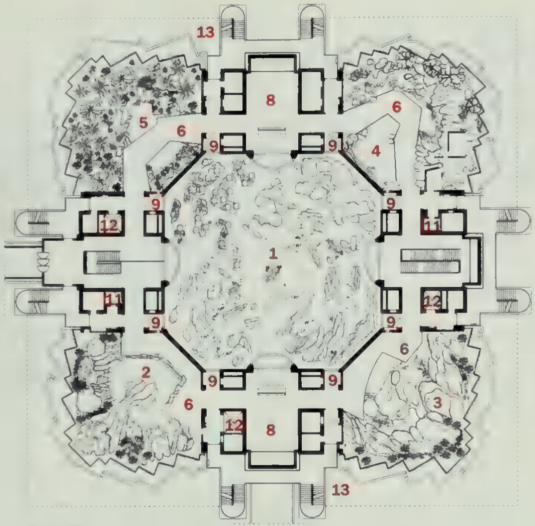
Four different habitats, including tanks and landscape, represent the Atlantic, Antarctic, Pacific, and Indian Oceans (right and below). These surround a larger central tank, which holds 1.22 million gallons of water. While the flora and fauna are authentic, much of the structure, including rocks and coral reefs, is manmade (opposite bottom).







LEVEL ONE



LEVEL TWO

1. *Open ocean*
2. *Atlantic Ocean*
3. *Antarctic Ocean*
4. *Pacific Ocean*
5. *Indian Ocean*
6. *Visitor circulation*
7. *Curatorial area*
8. *Mixed-media gallery*
9. *Contemplation rooms*
10. *Exit foyer*
11. *Restrooms*
12. *Elevator*
13. *Emergency exit area*

and 250 different species swimming in 1.56 million gallons of ocean water.

The lines between underwater life and the human realm are blurred. Remarkable optics, heightened by controlled internal lighting, allow clear views through the 12- to 14-inch-thick acrylic walls. As a result, fish from opposing oceans seem to coexist in a single visual field. The effect is surreal: cold-water sharks seem to glide by tropical fish in a seamless dance.

Plaques and descriptions of the marine life have been kept to a minimum; the pavilion is not overtly didactic. Instead, visitors experience the marine species in a series of meeting places. In the "contemplation rooms"—quieter, more intimate spaces with smaller, focused views, located on the lower level—visitors can concentrate on watching the graceful interplay of the schools of fish, an experience akin to watching music.

Visitors come and go via a covered ramp, a dual-level bridge that connects the water-surrounded aquarium with its land-based sister building. Ticket sales are housed there, along with shops, offices, galleries, and a conference area. Lining the long, high wall that organizes the support building is Ivan Chermayeff's giant mural of ocean life. High and low tech combine in the mural, which uses 60 variations of hand-painted blue and white Portuguese tiles to imitate a computer screen's pixels.

### Creative construction

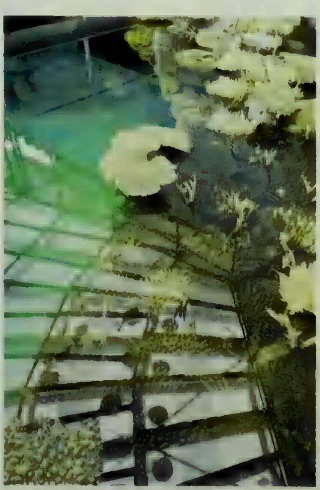
The $70 million Oceans Pavilion had an unusual genesis, the result of a unique design and construction collaboration that extends the understanding of the term "design/build." Chermayeff also serves as president of IDEA, Inc., a separate company that provides turnkey services beyond architectural design. IDEA produced feasibility studies and oversaw exhibit planning, construction (in collaboration with its partner, Engil, a Portuguese construction company), staffing and training for the aquarium, and even the choice of sea creatures. The partnership of IDEA and Engil set the budget and guaranteed a fixed price for construction.

According to Peter Sollogub, Cambridge Seven's principal-in-charge who worked on the project from the beginning, construction was complicated by the work habits of the Portuguese, which are different from those of American builders. "They really don't use shop drawings in Portugal," he says. "This building is the product of handcraft." But the team produced the project within its budget, and the aquarium was one of the first major structures ready for the exposition, which opened its doors in May.

Following the world exposition crush, projected to reach a peak of 80,000 visitors per day, the pavilion will be renamed the Oceanário de Lisboa and remain open as a public aquarium. One million people are expected to visit every year. Other significant infrastructure that will remain after the exposition closes in September include an 840-acre urban development project called EXPO URBE, which will combine 1,850 residential units, hotels, and office development. Rail lines, including a station designed by Spanish architect Santiago Calatrava, and a bridge across the Tagus River should encourage new horizons for Lisbon and for Portugal. ■

**Sources**

**Curtain wall:** *Bellapart*
**Lobby lighting:** *Poulsen*
**Elevators:** *Otis*
**Lobby mural tile:** *Ceramica Constancia*
**Acrylic:** *Nippura Co.*



2

# Boyd Park New Brunswick, New Jersey

## REDEVELOPING A 14-ACRE DOWNTOWN PARK LOCATED ALONG A HISTORIC CANAL LINKS A CITY'S PAST AND ITS FUTURE.

**by Michael Chotiner**

**Project:** *Boyd Park, New Brunswick, New Jersey*
**Owner:** *City of New Brunswick*
**Architect:** *Parsons + Fernandez-Casteleiro—Jeffrey G. Parsons, AIA, principal-in-charge; Manuel Fernandez-Casteleiro, design principal; Omar Perez, Chuck Tewfik, William Deegan, project team*
**Engineers:** *A. G. Lichtenstein and Associates, Inc. (canal and lock restoration); Paulus, Sokolowski & Sartor (civil, structural, mechanical, electrical)*
**Consultants:** *Arnold Associates (landscaping); H. M. Brandston and Partners, Inc. (lighting); Travers Associates (traffic); Rutgers Department of Anthropology (historical)*
**General Contractors:** *Epic, Inc. (park structures); Robert Charles Enterprises, Inc. (canal and lock restoration)*

**Cost:** *$10 million (includes canal and lock restoration)*

Boyd Park, built on a narrow parcel of land along the Raritan River in New Brunswick, New Jersey, has been a strategic site since 1676. That year William Penn authorized surveyors to study the feasibility of digging a canal that would extend the Raritan to form a link between the Delaware River and New York Bay. Ultimately, the slip of land where the park sits became the terminus of the Delaware & Raritan Canal, a water route that thrived from 1838 until 1933. Today the waterfront site is still strategically significant: it's the lynchpin in New Brunswick's plans to revitalize its waterfront.

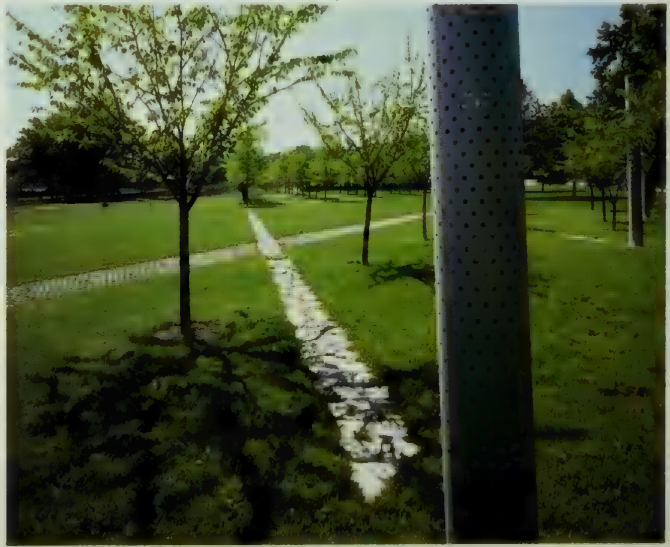
When Boyd Park was originally built in the late 1950s, it included a ball field, a few tennis courts, and swing sets. No one saw much more potential for the site until the D&R Canal and its outer towpath were put on the National Register of Historic Places in 1973. The city recognized then that restoring the old canal locks on the park site and beefing up the size and offerings of the park itself might lure more residents as well as tourists.

That same year, the New Jersey Department of Transportation (DOT) asked the city for permission to extend Route 18, a busy thoroughfare, through New Brunswick—a request that came directly from Johnson & Johnson, the city's largest employer. Though it would guarantee the corporation's continued presence in New Brunswick, the extension would effectively cut off the waterfront from the downtown, marooning Boyd Park and the locks. City officials agreed that the DOT could extend the highway, but only if the agency paid to rehabilitate the historic locks.

The DOT capitulated, but the agreement between the agency and the city was loose, and the amount and type of funding were never spelled out. As a result, the locks were left to decay while the park, rendered largely inaccessible by Route 18, declined into a scrubby, rubble-strewn wasteland.

### Reinvigorating the park

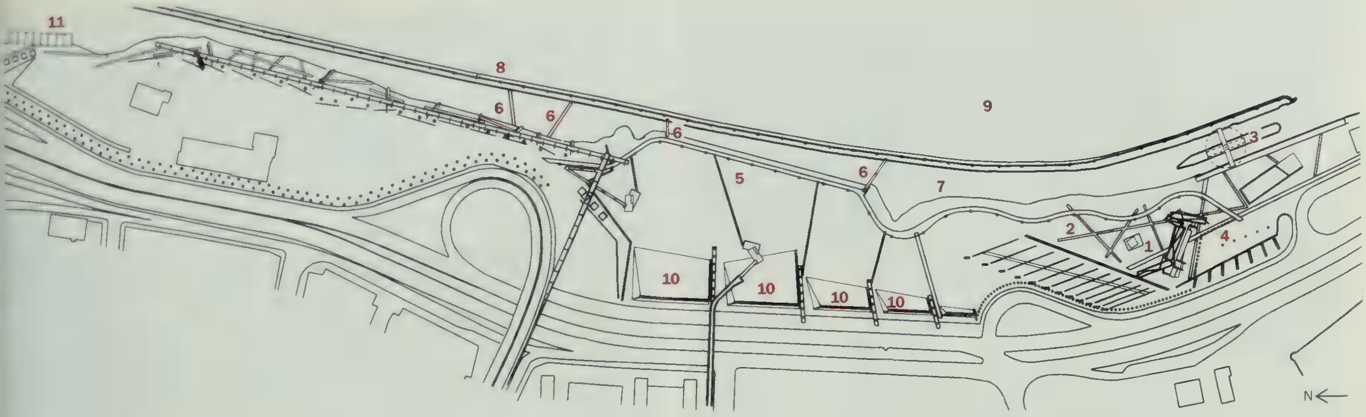
In 1989 former mayor and state senator John A. Lynch decided to take action—not only to restore the locks and the park, but to encourage private housing development on the waterfront's blighted and vacant lots. He renegotiated with the DOT and secured funding from them and from other sources. The



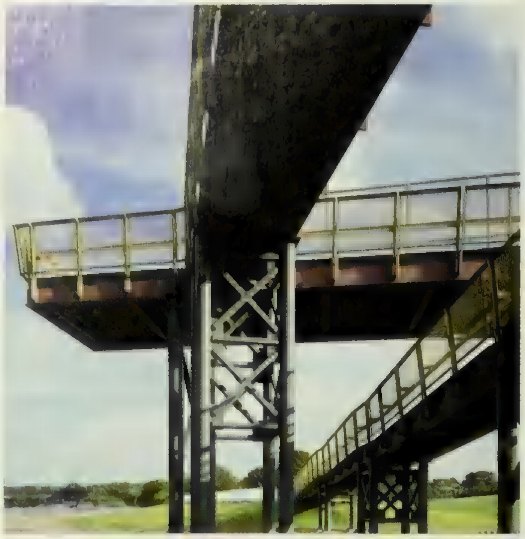
**A path of grass pavers intersects the limestone "shadows" of light posts near "The Bosque" (above). Perforated concrete platforms at each bridge celebrate park entry points (opposite).**

PHOTOGRAPHY: © EDUARD HUEBER

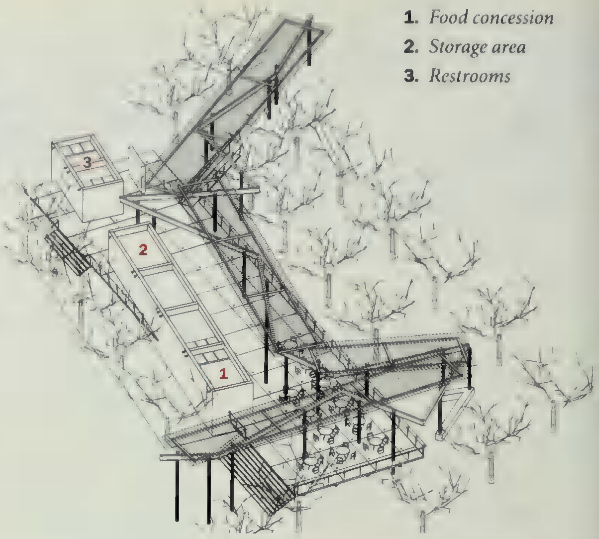
*Michael Chotiner is a freelance writer in Brooklyn, New York.*



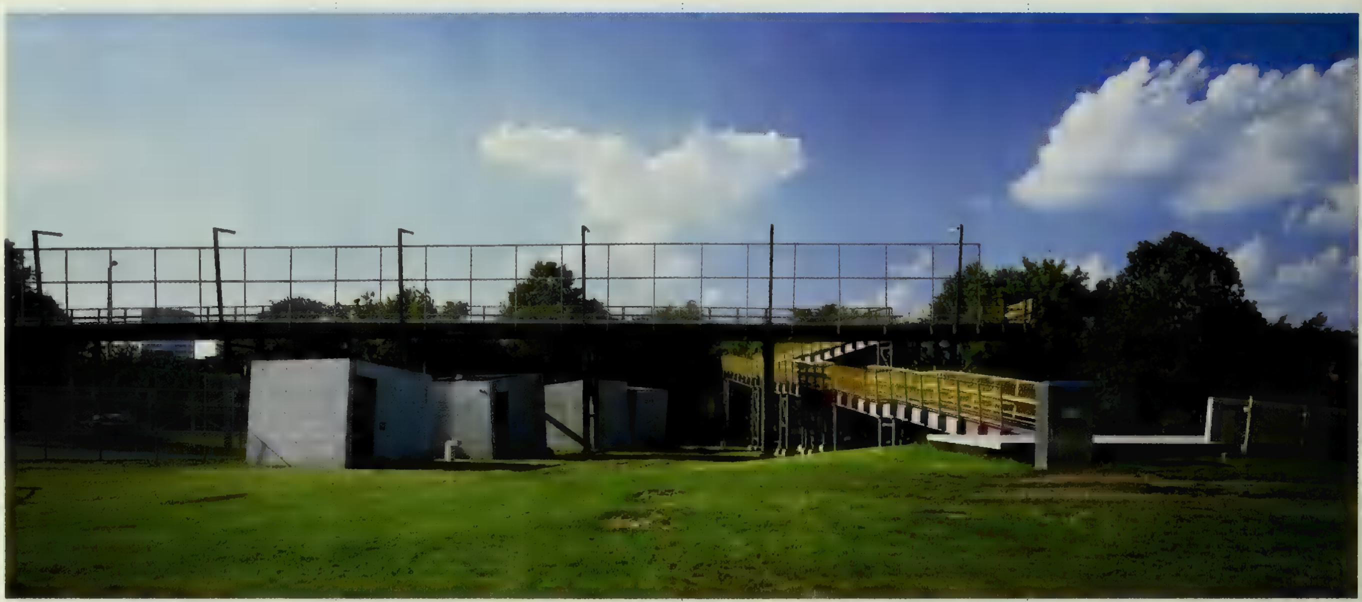
1. *Café/exhibit structure*
2. *Forest, "The Bosque"*
3. *Historic locks*
4. *Parking*
5. *Multiuse field*
6. *Pedestrian bridge*
7. *Canal*
8. *Outer towpath*
9. *River*
10. *Earth berms*
11. *Boat dock*



The New Street Pedestrian Bridge has a steel-grid deck with steel railings painted yellow (left). The jaunty buildings at the end of the Albany Street Bridge house restrooms and storage facilities (below).



1. *Food concession*
2. *Storage area*
3. *Restrooms*



city then hired Parsons + Fernandez-Casteleiro to "supply a vision" for the park, says principal Jeffrey Parsons. That included finding a way to bring people safely and easily into the park, creating performance and exhibition facilities, installing pathways, and activating the entire length of the park.

To gain approvals and permits and to secure additional funding, Parsons, with city officials and the New Brunswick Development Corporation (a nonprofit corporation that served as master planner and coordinated the project), clarified that vision of the park to the more than 15 government agencies and preservation groups involved in the site. These ranged from the Environmental Protection Agency to the New Jersey Canal Society.

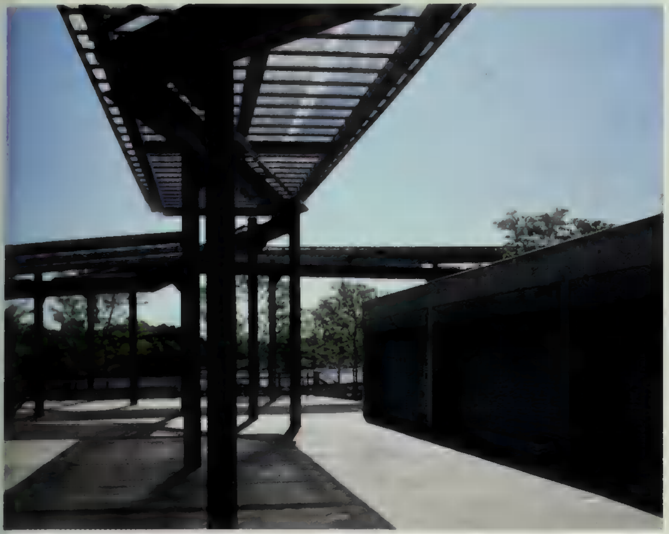
The three-phase construction began in 1994. The first two phases, including the park infrastructure and the locks restoration, were completed this summer at a cost of about $10 million. The final phase, which includes a fourth access bridge and additional restrooms and parking, awaits funding.

The park is divided into three areas: a five-acre field, a flexible venue for activities ranging from outdoor performances to ethnic festivals; the historic locks area, which includes a forested area that Parsons calls "The Bosque"; and the canal-edge walkways and gardens. The park has facilities for boating, jogging, roller-skating, and, in the winter, ice skating.

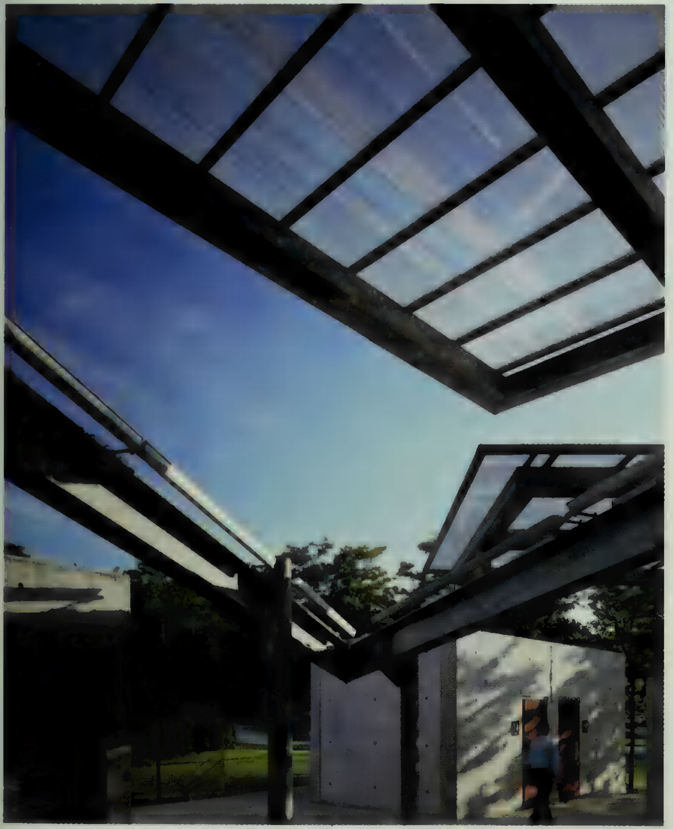
### Establishing access

Visitors enter via one of three bridges. The New Street Pedestrian Bridge, designed by the architects, leads over Route 18 from downtown to the edge of the canal. On the park side, the steel bridge ends at a landing platform that's intended to give visitors a sense of arrival. The perforated concrete is lit from beneath so that the deck glows in the evening. Similar landing platforms were added at the terminuses of the existing Oliver Street and Albany Street bridges.

A ramp leading pedestrians into the park was also added to the Albany Street Bridge, primarily a vehicular bridge that carries traffic over the river to the next town. Near the foot of this bridge is the boat dock, where people can rent a canoe or paddleboat. A nearby complex of smallish concrete buildings houses restrooms and park storage facilities. "We wanted to animate all of the buildings in the park," Parsons says, explaining the jaunty, off-kilter angles of their walls.



The café/exhibit structure is roofed with polycarbonate sheets that provide "just a degree of a sense of enclosure," Parsons says. The strips of roofing also offer shelter to visitors in case of rain. The 40-by-160-foot platform provides a space for outdoor concerts and plays.



Three low steel bridges lead over the canal and to the outer towpath, which was restored. A fourth canal bridge is a replica of the original wood swing bridge formerly on the site. Used to move donkeys from the inner path to the outer, the bridge would swing out of the way when a boat approached.

The inner towpath was replaced with a curving esplanade made of crushed stone and glass block pavers. In places the path comes close enough to the canal's edge that people can reach out and touch the water.

Near the locks are the concrete walls of the café/exhibit structure, a complex of stalls that includes a food concession, space for small exhibitions, restrooms, and storage facilities. Hoisted by pilotis to one foot above the river's 100-year flood level, the 40-by-160-foot concrete slab offers tremendous views of the river and the canal.

Arriving buses and cars park near the café/exhibit area. The parking area also serves as a place to set up flea markets. Adjacent playground equipment engages children before and after they tour the locks.

Correct lighting of the structures and the park was a high priority during the planning process. "It's important for an urban park to be active after dusk, and we wanted to dramatize the activities taking place," Parsons explains. At the café/exhibit structure, fluorescent lighting reflects off the surface of the steel columns and shines through the translucent roof panels. A series of graduated-height torch lights flank one walkway as it passes through an open field. Fashioned of perforated stainless steel, the lights are spaced at regularly decreasing intervals. Strips of rough-hewn limestone, which look like shadows cast by the light poles, emanate from the base of the lamps and intersect the concrete-grid path at an oblique angle.

"Here we were playing some games with perspective," Parsons says. "The limestone strips evoke the old foundations of historic buildings formerly on the site and the variations of the canal's width during different phases of its development and decline." Concrete bollards throughout the park suggest hitching posts for mules.

Low berms along the highway and in the field area shield the park from traffic noise, although occasional breaks allow passersby to get a glimpse of the riverbank. The berms also provide seating during outdoor performances.

As for the city's hopes of encouraging housing development, new mid-rise rental apartments have already been built nearby on formerly abandoned downtown blocks. Additional projects are being discussed. "The park has given the community almost a mile of riverbank and access to a vital historic site," says city director of parks Jim Campbell. That's something people want to be near. "Someday soon we'll have a real neighborhood." ■

**Sources**

**Skylights:** *GE Lexan*
**Plastic glazing:** *Polygal USA*
**Metal doors:** *Atlas Door*
**Sliding doors:** *American Metal Door*
**Locksets:** *Yale*
**Pulls:** *Rockwood Manufacturing*
**Paint:** *Con-Lux Coatings*
**Paneling:** *Comtec Industries*
**Furniture:** *Knoll*
**Pavers:** *Samson Stone*
**Fencing:** *Anchor*

# 3

# P.S.1 Contemporary Art Center Long Island City, New York

## A TURN-OF-THE-CENTURY SCHOOL YIELDS A VIBRANT, ENERGETIC EXHIBITION SPACE THAT BLURS THE LINE BETWEEN BUILDING AND ART.

**by Andrea Truppin**

**Project:** *P.S.1 Contemporary Art Center, Long Island City, New York*
**Owner:** *City of New York; New York City Department of Cultural Affairs, sponsoring agency; New York City Department of Design and Construction, contracting agency*
**Architect:** *Frederick Fisher+Partners—Frederick Fisher, principal-in-charge, Joseph Coriaty, partner-in-charge*
**Architect of Record:** *David Prendergast, principal; Deborah Laurel, project architect; Jeffrey Magella, Dan Hill, Scott Weinkle, project team*
**Engineers:** *Mariano Molina (mechanical and electrical); Robert Silman Associates (structural)*
**Consultants:** *Signe Nielsen, P.C. Landscape Architecture (landscaping); Randy Sabedra (lighting); Reginald Hough (concrete)*
**General Contractor:** *Foundation Construction Consultants*

**Size:** *125,000 square feet, including exterior sculpture rooms*
**Cost:** *$8.5 million*

As the elevated subway screeches around the last curve into the Court House Square station in Long Island City, Queens, the P.S.1 Contemporary Art Center announces itself in the distance in bold, three-story-high letters painted on one of its faded brick walls. The sign is emblematic of P.S.1's new commitment to welcoming the general public.

When P.S.1 opened in 1976 in an abandoned turn-of-the-century elementary school, it provided a permanent home for a peripatetic museum, the Institute for Art and Urban Resources, founded in 1971. The organization was a product of the late Brendan Gill, the former architecture critic at the *New Yorker,* and Alanna Heiss, a leader in the alternative space movement, whose aim was to eliminate the elitism of the art establishment by deinstitutionalizing art.

In P.S.1's inaugural exhibition, "Rooms," for example, dozens of artists filled the dilapidated building with art. They painted on blackboards and brick, tore into walls and floors, and showed that an exhibition environment need not be precious and can itself lend meaning to art.

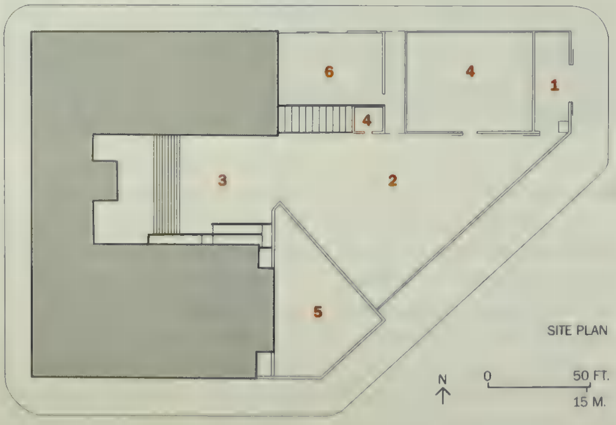
In the years following, P.S.1 mounted more traditional exhibitions in its formal galleries, a series of classrooms renovated by artist Robert Ryman and connected by simple doorways. Visiting artists worked in on-site studios, keeping the process of making art close by. But while P.S.1 succeeded in showing a broad range of controversial work that might have been ignored by other galleries, it did not attract a broad audience. This might have been due, in part, to its location in a faded industrial area of Queens, across the East River from midtown Manhattan. In addition, the artists and critics who frequented P.S.1 enjoyed the clubby mystique involved in finding the building's obscure entrance and negotiating the crumbling, complex interior. A larger problem was that, despite the building's huge footprint, many of the building's spaces were unusable because of their poor condition, inaccessibility, or small size.

The $8.5 million renovation of P.S.1 sought to solve these problems. The delicate task of the designers was to turn P.S.1 into a "legitimate museum, not just an ad hoc space," but without losing the building's poetic qualities or P.S.1's edgy, vibrant character, says design architect Frederick Fisher.

Occupied throughout the three-year renovation and expansion, the new P.S.1 was inaugurated last fall. With 125,000 square feet of indoor and outdoor exhibition space, it is one of the largest contemporary art centers in the world.

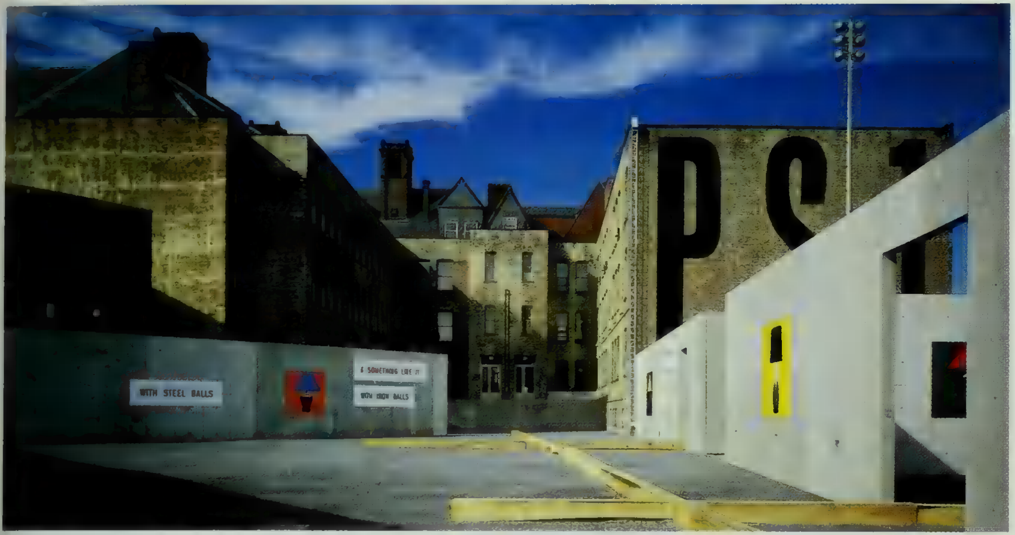
*Andrea Truppin is a writer and documentary filmmaker in New York City.*

1. *Exterior entry*
2. *Sculpture courtyard*
3. *Inner courtyard*
4. *Sculpture room*
5. *Adjacent lot*
6. *Loading area*

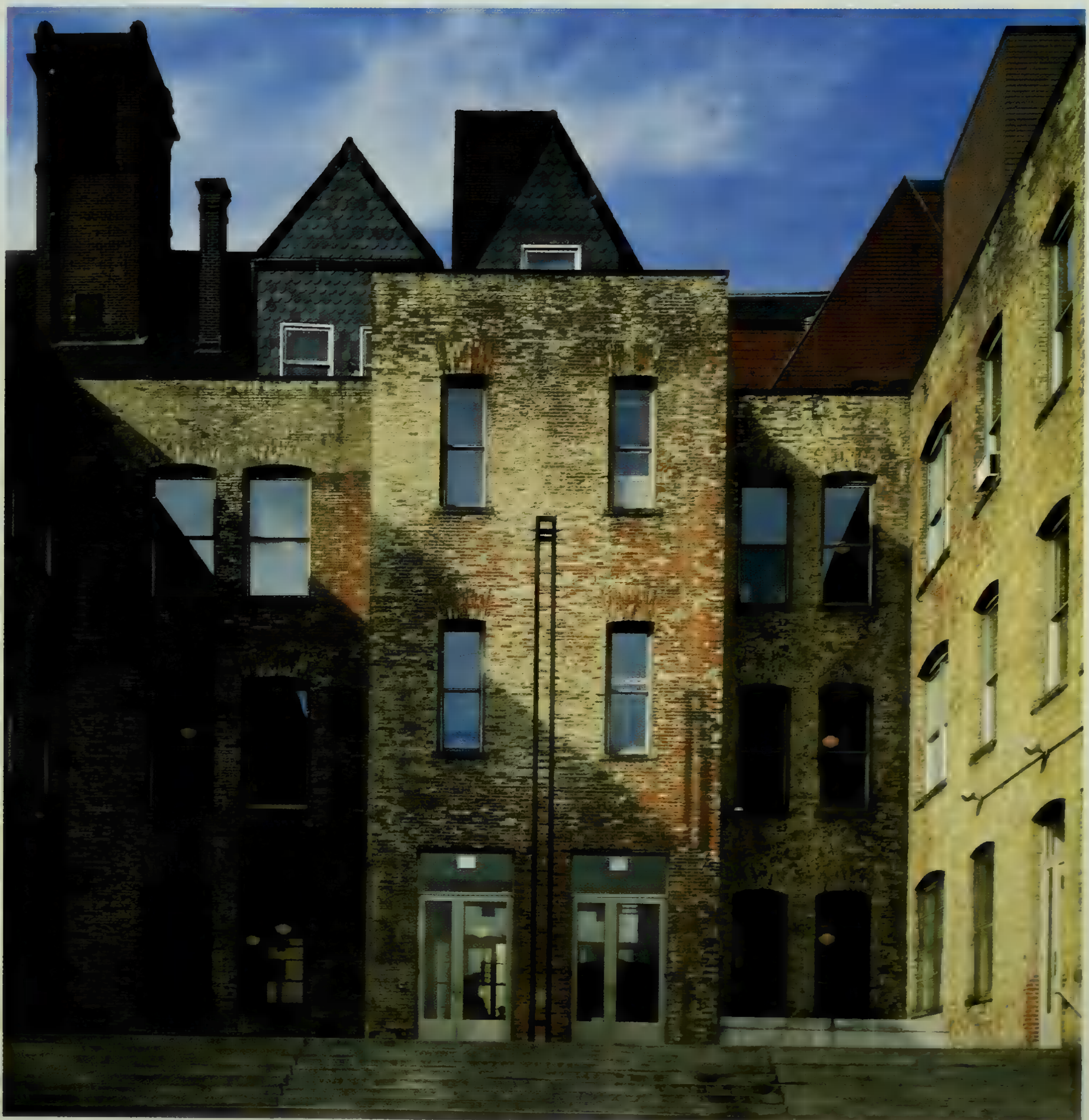


SITE PLAN

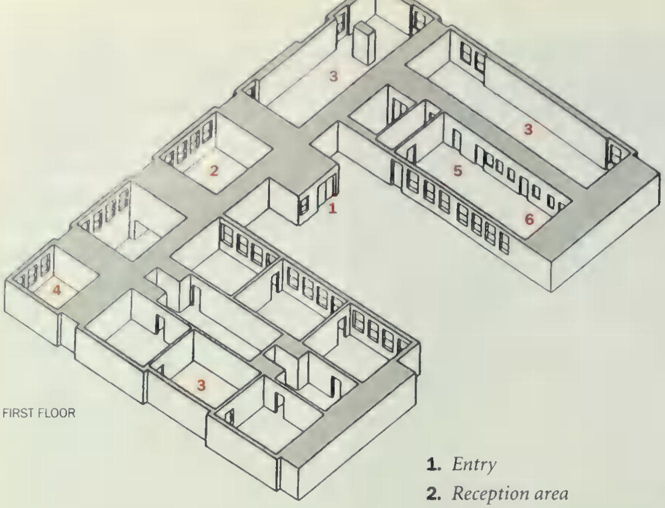
PHOTOGRAPHY: © MICHAEL MORAN



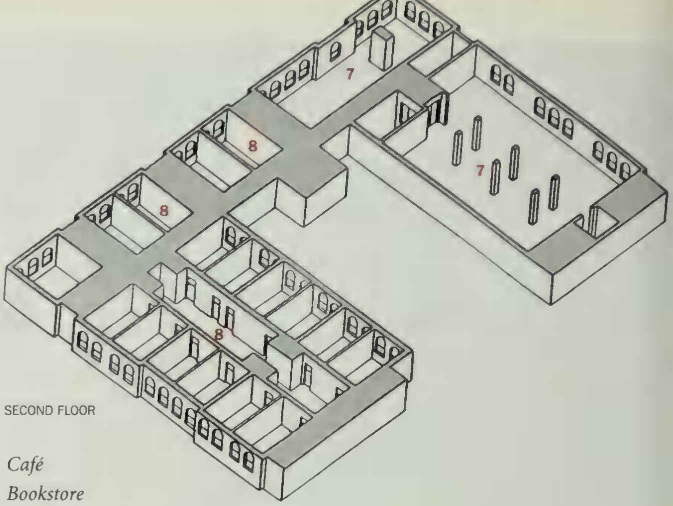
The former schoolyard was converted to an outdoor gallery, with floors of crushed gravel and concrete walls. Visitors wend their way to the entrance by passing through these outdoor rooms.



The school's two wings, built 13 years apart, are joined at a central entry area (right). The entrance, formerly on the other side of the building, was flipped to make P.S.1 more accessible to the nearby subway station.

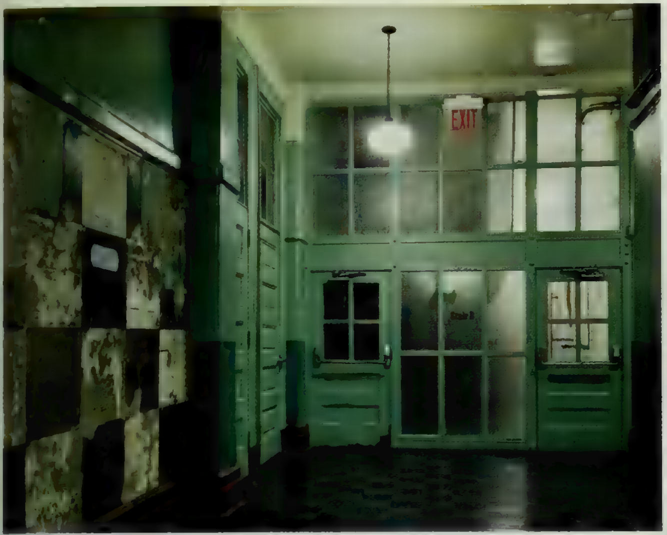


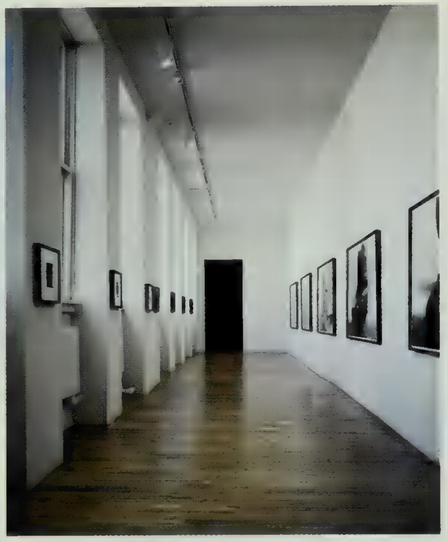
FIRST FLOOR



SECOND FLOOR

1. *Entry*
2. *Reception area*
3. *Gallery*
4. *Video gallery*
5. *Café*
6. *Bookstore*
7. *Sculpture gallery*
8. *Studios*





Some existing spaces and finishes were preserved (far left), some were re-created from fragments (plans, opposite), and others were destroyed to create entirely new spaces (left). Virtually all of the windows were left uncovered so visitors may pause in their perusals to look outside (below).

In the past 15 years, P.S.1 has been joined in Long Island City by other arts-related organizations, many housed in renovated factories and warehouses. Together these are drawing traffic from across the river.

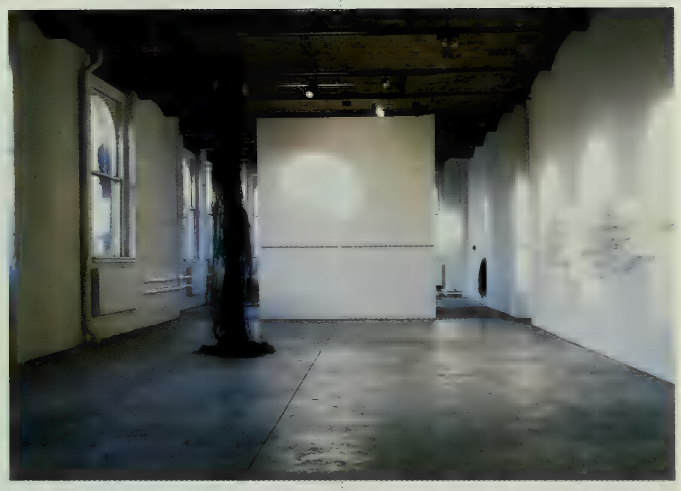
The new design benefited from the input of an architects' committee, which included the late Max Gordon and Richard Gluckman in addition to Fisher, and an artists' committee, made up of James Turrell, Richard Nonas, Richard Deacon, and Ryman. Sculptors, in particular, were involved, "because they are so often caught by the problems of space," says Heiss. Involving artists in the planning process let P.S.1 avoid expensive mistakes, such as building outdoor spaces for large sculptures with no room for a cherry picker to move them.

P.S.1 was built in two phases, the south wing in 1892 and the north wing in 1905. The brick and terra cotta Romanesque Revival building, with massive stone foundations and delicately ornamented arches, embodies a historic change in construction technique from load-bearing brick walls in the south wing to steel-frame construction in the north wing. Part of the goal in the renovation was to use this construction intelligently.

The redesign's most fundamental alteration was to invert the building, turning the unadorned back into the front. The school was built before New York's subway system, so none of its original entrances faced the stations behind the building. The new entrance, at what was the back, is signaled by an existing tower.

New concrete stairs, broad enough to serve as seating, sweep grandly up to the entrance, filling the courtyard and culminating in a terrace that doubles as a stage. The steps lend grandeur where none was originally intended, ironically associating the utilitarian rear of the building with grander art institutions such as the Metropolitan Museum, with its iconic steps. The formal approach to the building also edges P.S.1 away from its gritty youth toward a respectable maturity.

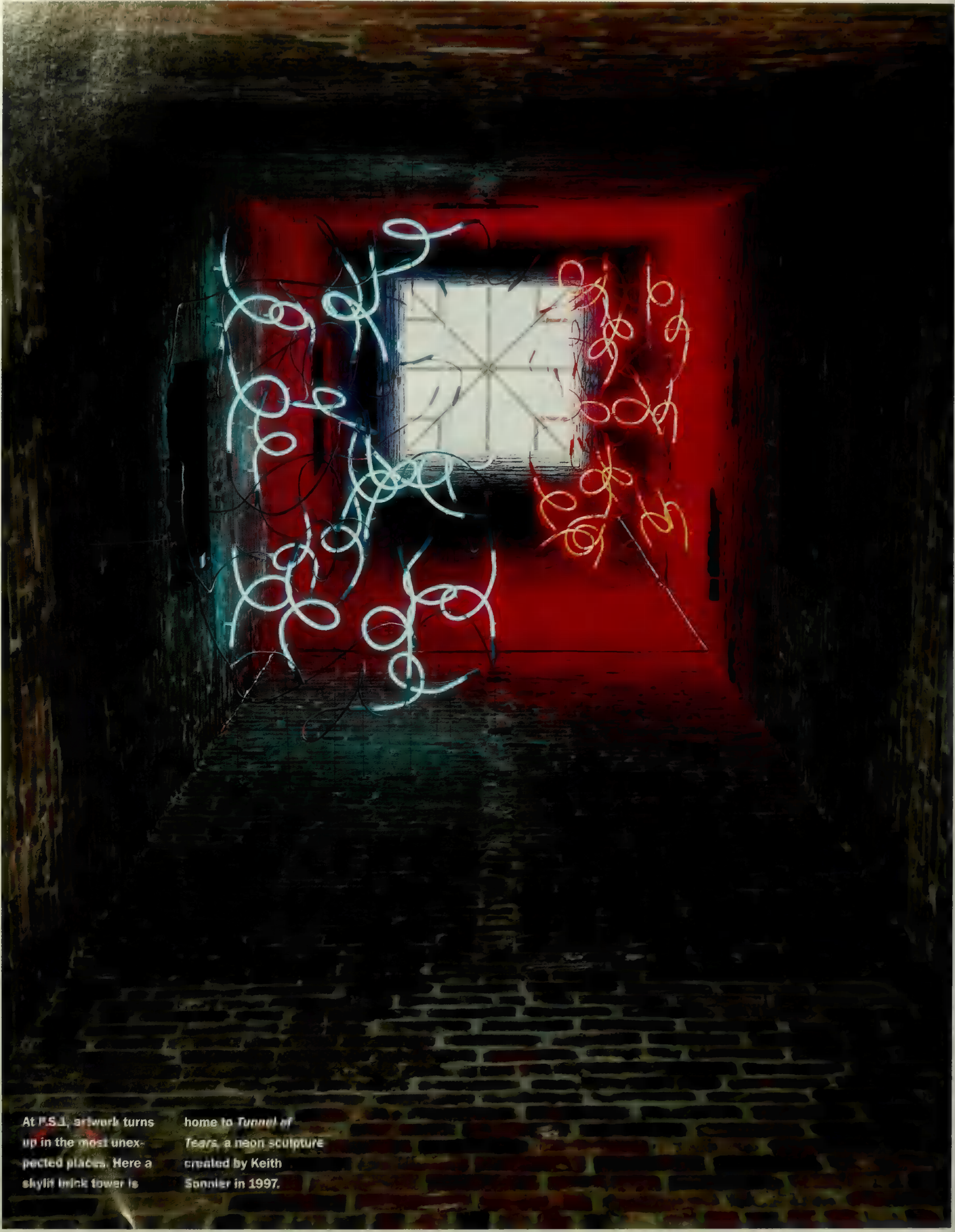
The largest addition of exhibition space is the outdoor courtyard, which was once the schoolyard. Before the renovation, the yard, paved and surrounded by a chain link fence, served as a sculpture garden. But the art competed for attention with a busy thoroughfare and the surrounding buildings. "Much art needs to have hermetic isolation to establish its own turf. When you contain it, the artist makes the environment and creates the world," Fisher says. "If spaces are 'leaky,' if they have holes and interference from the outside, they deflate." The solution was to enclose the entire 23,000-square-foot courtyard with a concrete wall. The pavement was replaced with crushed gravel. To one side of the courtyard are two roofless rooms, one large and one small, in which outdoor sculptures can benefit from the same type of contained neutral environment used in many indoor galleries.



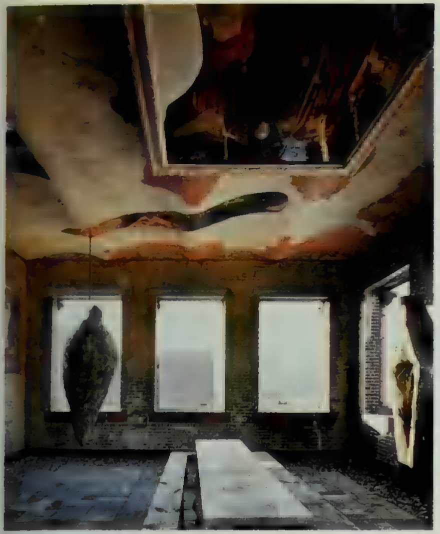
## Interior changes

If the courtyard was a tabula rasa, creating new exhibition space inside called for a radically different approach. While it might have been simpler to rip out the old rooms and install a series of white boxes, Heiss (now P.S.1's executive director) and Fisher were committed to preserving the heterogeneity of the "found" space and celebrating its past life as a school. Its oddly shaped and partitioned rooms, its surfeit of staircases designed to handle the rush of pupils between classes, its blackboards and water fountains, its long hallways and multiple doors, windows, and closets—all these held traces of the school's history. The architects likened the design experience to "editing," rather than imposing an architectural vision.

Approximately 25 percent of the new exhibition space was attained by opening up warrens of classrooms, locker rooms, and bathrooms. The new café/bookstore, which also contains video installations, was originally eight rooms. As elsewhere in the building, ghosts of the original rooms remain, here in the form of redundant doors between the new space and the hallway.



At P.S.1, artwork turns up in the most unexpected places. Here a skylit brick tower is home to *Tunnel of Tears*, a neon sculpture created by Keith Sonnier in 1997.



**Galleries (left and right) are located in the old classrooms. Several of the original pieces from the 1976 "Rooms" exhibition became integral parts of the building, including the Richard Serra room in the attic and James Turrell's *Sky Room* (below).**

The architects felt that the "humanness" of the building resided in the visitor's freedom to wander at will, constructing a partially mediated personal experience. Accordingly, they retained all six staircases to allow visitors "to bail out or shift strategy and not always go back to the same place," Fisher says. Two staircases became sites for "Vertical Paintings," a group effort by 14 artists that can be viewed only by walking up or down the stairs. The contiguity of these paintings to the original peeling paint of the staircase walls shows resourcefulness in finding surfaces for art. Similarly, a utility closet might contain art, or it might contain cleaning equipment. The museum succeeds in priming the visitor's perception to find expression in every corner of the environment, not only in the "real" artworks.

An enormous sculpture gallery now spans the width of the north wing. The artists' studios that were formerly in this space were moved to the south wing. A vaulted terra cotta support system, discovered under the plaster ceiling in the sculpture gallery, was restored. The wood floor was ripped out and replaced with a new concrete surface, steel-troweled to a glossy patina, that can support heavier loads. A powerful colonnade marches between the gallery's front and back entrances. Its white surface stands out against the brick red vaults to reinforce the axis and huge scale of the space.

A third-floor gallery that was once the school's auditorium had been P.S.1's largest column-free exhibition space—the pitched roof above is supported by wood trusses. The light-flooded room, which boasts 25-foot ceilings, was beloved by artists, but its two window walls left few surfaces on which to hang art. In a bold move, the architects inserted a 60-foot-square box into the space, creating a slightly smaller but more usable gallery that can hold large paintings, while the remaining space on the window walls became narrow, daylit galleries suitable for smaller works.

## Community outreach

P.S.1 had long been involved in art education. The renovation allowed them to increase workshops for neighborhood children, running after-school and weekend programs. The architects placed the art education studios in the basement, which has windows, so that kids could make noise and "throw paint around" without disturbing visitors to the museum, Heiss says.

Budget restrictions precluded bringing the impressive attic space, with its elegant roof trusses, up to code or installing air conditioning, although heat is provided by radiators. This limits the kinds of art that can be housed at P.S.1 in the hot and humid New York summer.

Most of the windows in the building remain uncovered. This approach works against what Fisher calls "museum fatigue," a sense of being in a hushed, rarefied environment, out of touch with the world. Many windows frame spectacular views of Manhattan, which, after seeing everything as art inside P.S.1, begins to resemble a giant outdoor sculpture. ■

**Sources**

**Steel entrance doors:** *Torrance Steel Window Co., Inc.*

**Locksets:** *Schlage*

**Floor tile:** *Kentile*

**Downlights:** *Edison Price*

**Plumbing fixtures:** *American Standard*

## 4

# Elmhurst Art Museum Elmhurst, Illinois

## A SUBURBAN CHICAGO COMMUNITY ARTS FOUNDATION INCORPORATES A PROTOTYPE SUBURBAN HOUSE DESIGNED BY MIES VAN DER ROHE.

**by Craig Kellogg**

**Project:** *Elmhurst Art Museum, Elmhurst, Illinois*
**Owner:** *Elmhurst Fine Arts and Civic Center Foundation*
**Architect:** *De Stefano + Partners—James R. De Stefano, FAIA, managing partner; Avram Lothan, AIA, design partner and project architect; Ferdinand Scheeler, AIA, technical partner; John Winner, AIA, Laurence Saint Germain, design team*
**Engineers:** *Tylk Gustafson and Associates (structural); Environmental Systems Design (mechanical, electrical, plumbing)*
**Consultants:** *Peter L. Schaudt (landscape); Susan Johnson Design (graphics); Bob Lane (signage)*
**General Contractor:** *Beacon Construction*

**Size:** *15,200 square feet*
**Cost:** *$2.2 million*

One wonders how Mies van der Rohe might have felt watching the steel structure of his McCormick House being chopped in half and then rolled three blocks on axles welded to the frame. The spectacle, though traumatic, was lifesaving, since today the 2,200-square-foot house is settled and once again occupied, now as part of a 15,200-square-foot museum in Elmhurst, Illinois. The staff uses the house's former bedrooms as offices, and lecture audiences assemble in what were once the living and dining rooms.

As the Elmhurst Art Museum's "primary artifact" in a broad collection consisting mostly of paintings and prints, the house has proven to be an attraction in its own right. Busloads of visitors now stop in Elmhurst en route to Mies's Farnsworth House, some 50 miles away in Plano, Illinois.

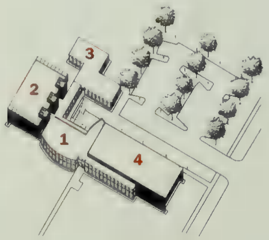
Built in 1950–51, the McCormick House was one of only three Mies-designed single-family residences in the United States. Real estate investors with plans to demolish the house and build something grander became interested in the property when it appeared on the market in the early 1990s. Although neighbors had mixed feelings about the building's severe Modernism, they knew the house brought distinction to their community and should be saved.

Meanwhile, the Elmhurst Art Museum, a community-based organization founded in 1946, was looking for new quarters. After 10 years in a local community center, the museum's organizers secured a site in Elmhurst's Wilder Park and began plans for a building. Around the same time the McCormick property became available. With the fundraising efforts of museum patrons and the neighbors of the house, the property was quickly purchased by the museum, for about $500,000. The McCormick House was subsequently moved to Wilder Park and its land was sold to developers, recouping much of the money put up by the museum.

### Old meets new

Today the house constitutes one of three major components of the Elmhurst Art Museum, completed last fall by De Stefano + Partners. Serving as the anchor for the complex and, to a degree, as inspiration for the remainder of the structure, the Mies house pushed the museum board toward an architectural solution that is more modern than they might have requested. "The board would have been happy with a red-brick building with white columns," says project architect Avram Lothan. While the museum "puts the house on the architectural map," the old building returns the favor, he says, by giving the new construction a physical history. In contrast to Mies's Modernism, Lothan says, the new work aspires to a "nervous energy" not found in serene, classic mid-century compositions.

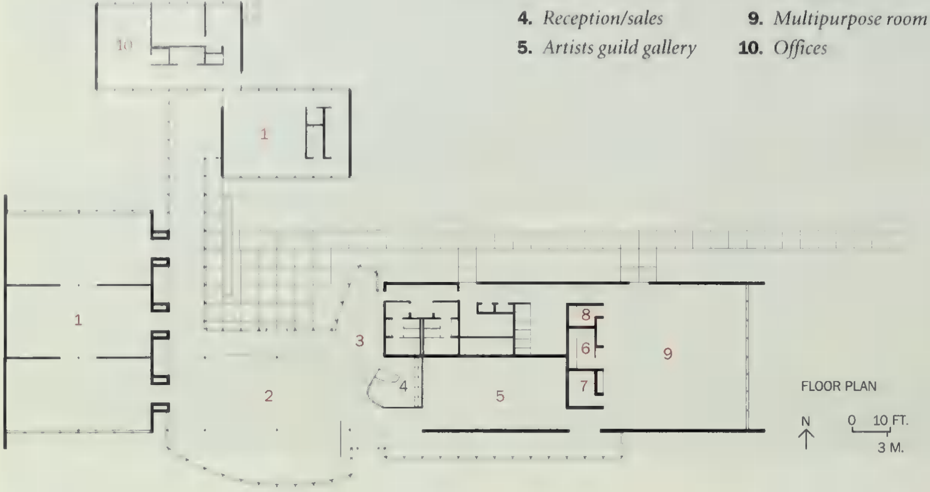
*Craig Kellogg is a freelance writer based in New York City.*



1. *Sculpture gallery*
2. *Gallery*
3. *Mies house*
4. *Educational area*

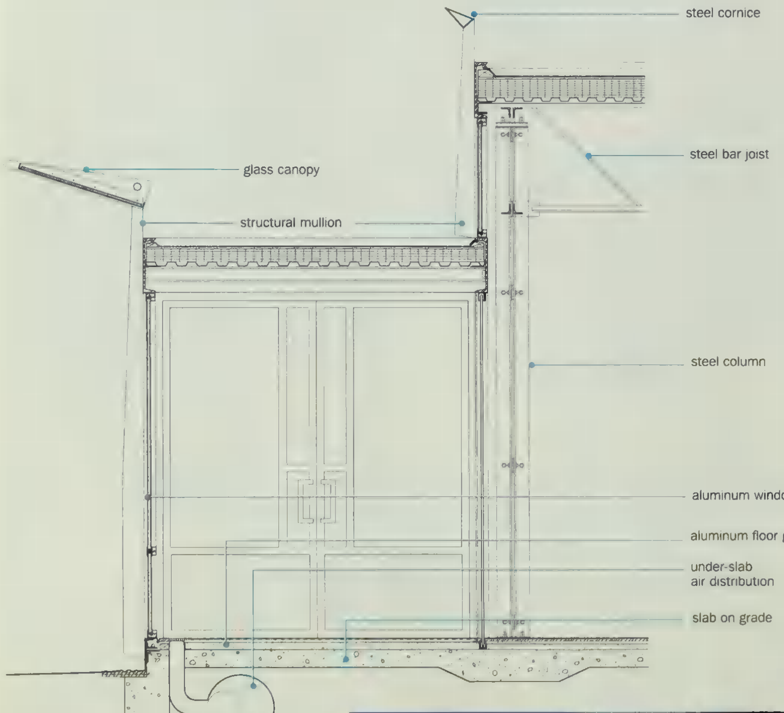
PHOTOGRAPHY: © BARBARA KARANT, KARANT & ASSOCIATES

Bowed glass guides visitors to the entry (above). The courtyard provides the garden-like setting Mies called for in his guide to small-city museums.



1. *Gallery*
2. *Sculpture gallery*
3. *Foyer*
4. *Reception/sales*
5. *Artists guild gallery*
6. *Printmaking*
7. *Ceramics*
8. *Darkroom*
9. *Multipurpose room*
10. *Offices*

**Visitors enter the museum through the glass-walled sculpture gallery (opposite). In keeping with Mies's preference for unadorned surfaces, the ceilings reveal their structure and the floors are ebony-stained oak. Offset vertical mullions interspersed with slightly curved steel columns give the building a sense of rhythm (below).**



SECTION THRU VESTIBULE

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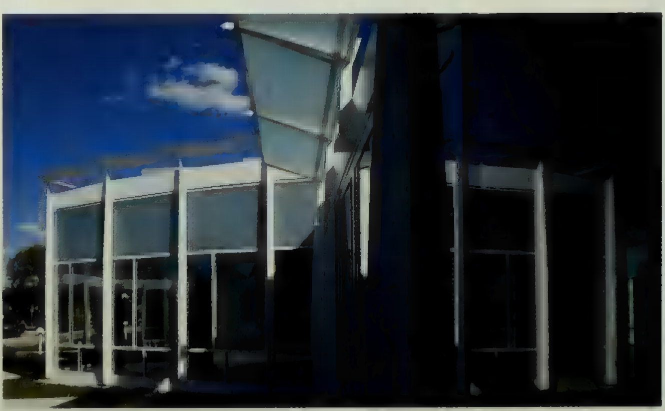
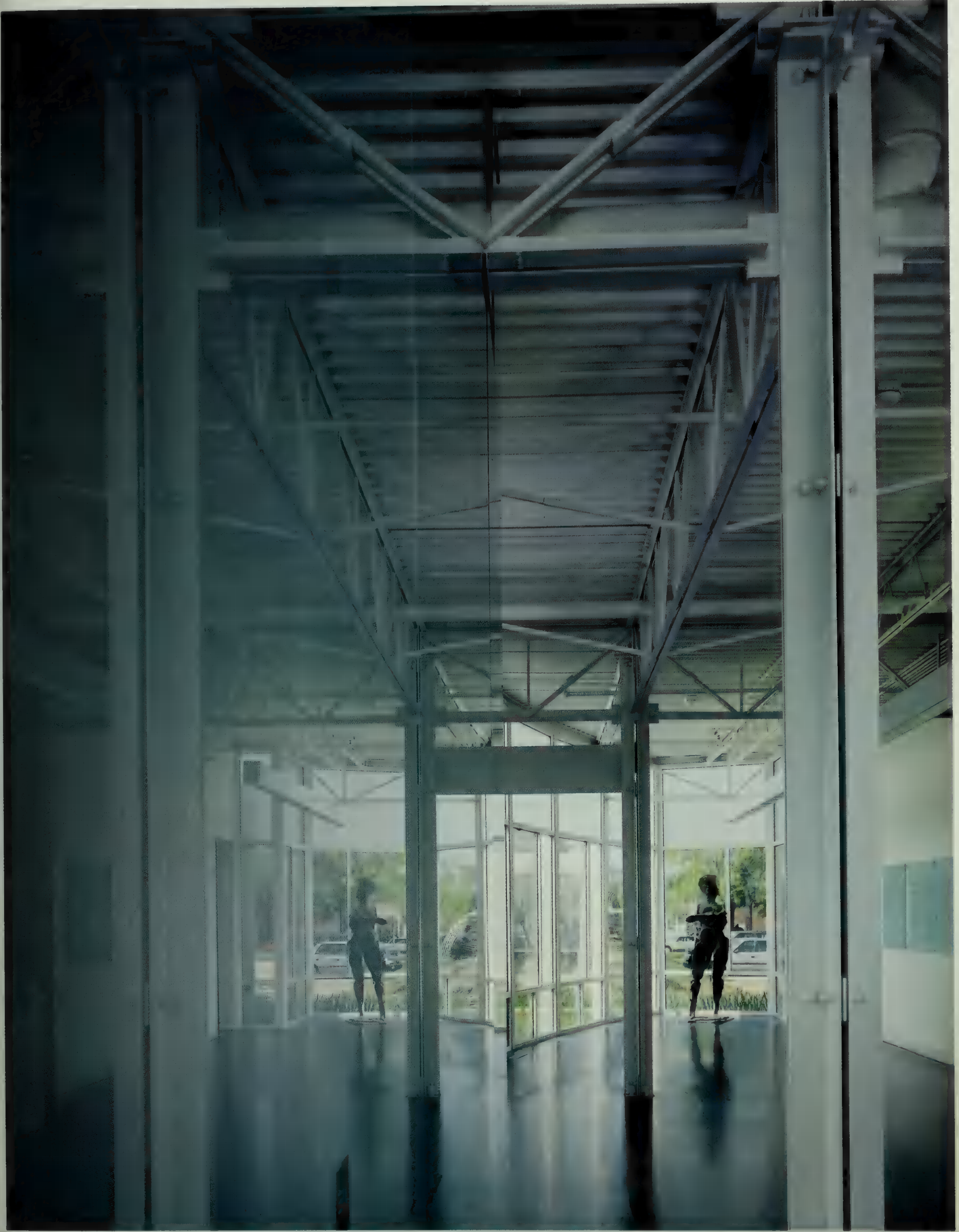


In 1943 Mies published a hypothetical plan for a small-city museum. This plan, which advocates a structure that is welcoming and placed in a gardenlike setting, served as a guide for Lothan. However, building the museum as one universal volume—a Miesian maxim—would have overwhelmed the house and failed to provide the variety of zones the program demanded. So Lothan distributed functions into a collection of interconnected pavilions.

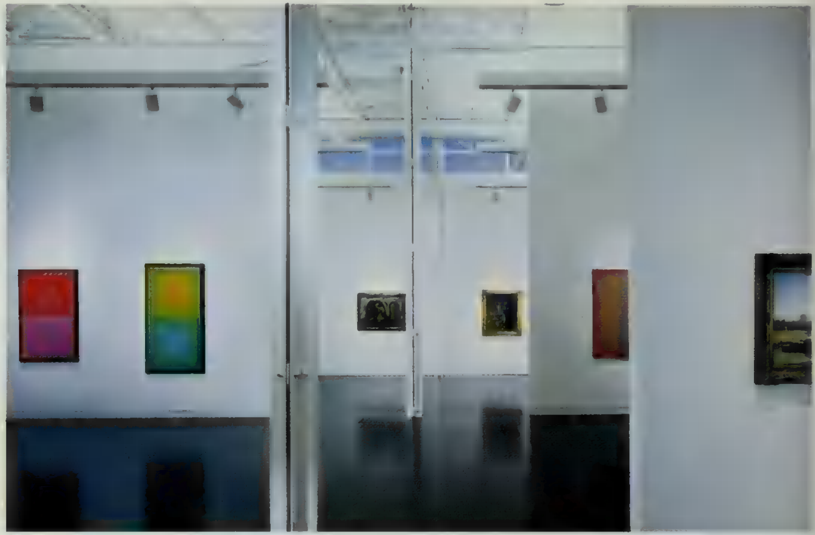
The entire project unfolds from a glass-walled corridor, referred to by Lothan as "the cloister," that rims two sides of an entry court. An entire wall of the Mies house's original aluminum windows (reglazed with insulated glass), once part of the living room, forms the third side of the court. In deference to the house, ceiling heights in the corridor are low, adding to the cloistered feel.

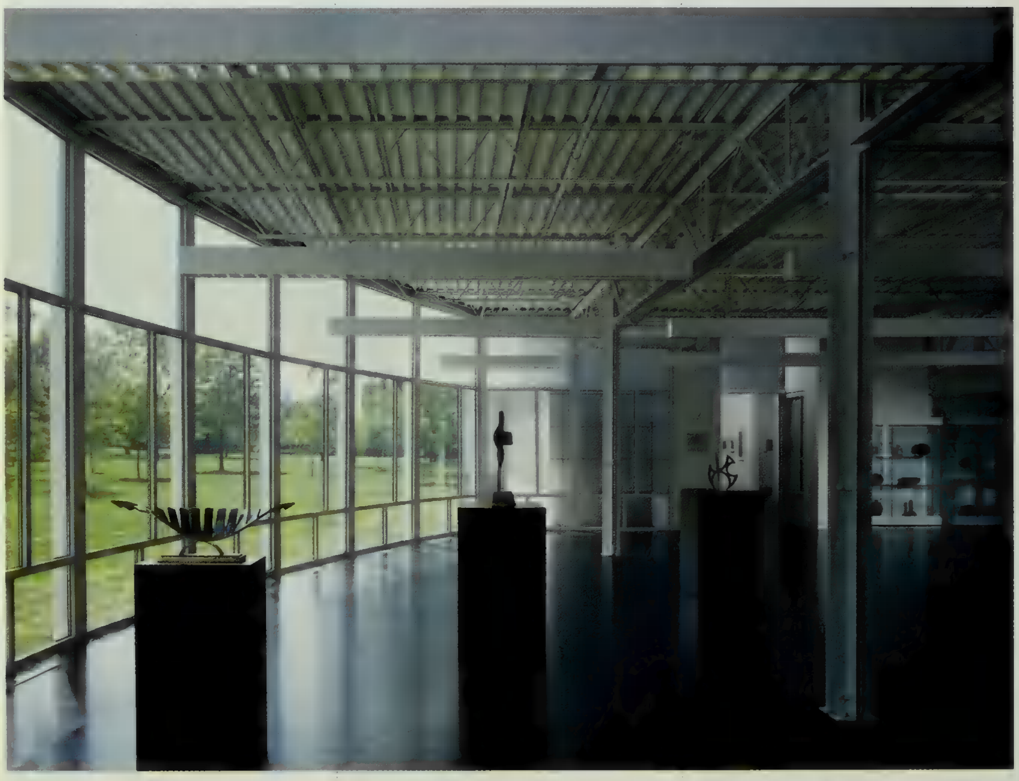
The house, with its expansive windows and masonry end walls, was commissioned by real estate developer Robert McCormick, who met Mies during the planning of 860/880 Lake Shore Drive. McCormick had Mies design the house for use as a subdivision prototype. When construction costs became prohibitive, McCormick scrapped the idea and decided to live there himself.

Although the house was costly



**The I-beam structure of the house is visible in the multipurpose room (below). Galleries (right and bottom) exhibit the permanent collection as well as works of a local artists guild.**





to build, several design flaws were uncovered in the process of moving it. For example, the narrow modular interior partitions, modeled after veneered doors, are an awkward, unmatched hodgepodge of oak, maple, and birch veneer panels installed side-by-side. But besides straightening out the house's steel structure and bringing it up to code, the design flaws were not corrected. Doing so would be, in a sense, tampering with a piece of architectural history. The house was reconfigured only in minor ways in order to suit the needs of the museum.

In addition to office space, the renovated house contains a small kitchen, moved from its original site among the bedrooms to the rectangle of public rooms at the front, and a multipurpose space that can on occasion serve as an art gallery.

### The origins of Modernism

The remaining portions of the museum include the main gallery block, which holds the permanent collection, and the educational block, a space where works by a guild of community artists are displayed. Also in this area are rooms for art classes held by the city parks department, as well as workspaces for artists, including a darkroom and printmaking facilities.

The gallery block, sheathed in silvery aluminum panels, dominates the building. In contrast to the crouching corridors, the gallery space is wide open, with 20-foot ceilings and clerestory windows at the north and south ends sandblasted to diffuse light. Elsewhere, sandblasted glass canopies shade the windows. Daylight is augmented by lighting from color-corrected fluorescent pendants throughout the museum. Tungsten halogen track spotlights, mounted beneath the fluorescents, are also used.

Three towers, located along the side of the gallery space and visible from the courtyard, accommodate the mechanical systems. Further along, the cloister widens into the sculpture gallery, with its curved, floor-to-ceiling glazing.

Updating a work by Mies gave Lothan a clearer understanding of the very origins of Modernism. In Chicago and in that era, he says, "Mies found the technical resources to build the things he had speculated about for so many years." ■

**Sources**

**Curtain wall:** *Lintel Wall Panels*
**Masonry:** *Belden Brick*
**Windows:** *Milco*
**Glass:** *Arcadia*
**Entry doors:** *Kawneer*
**Furniture:** *Knoll*
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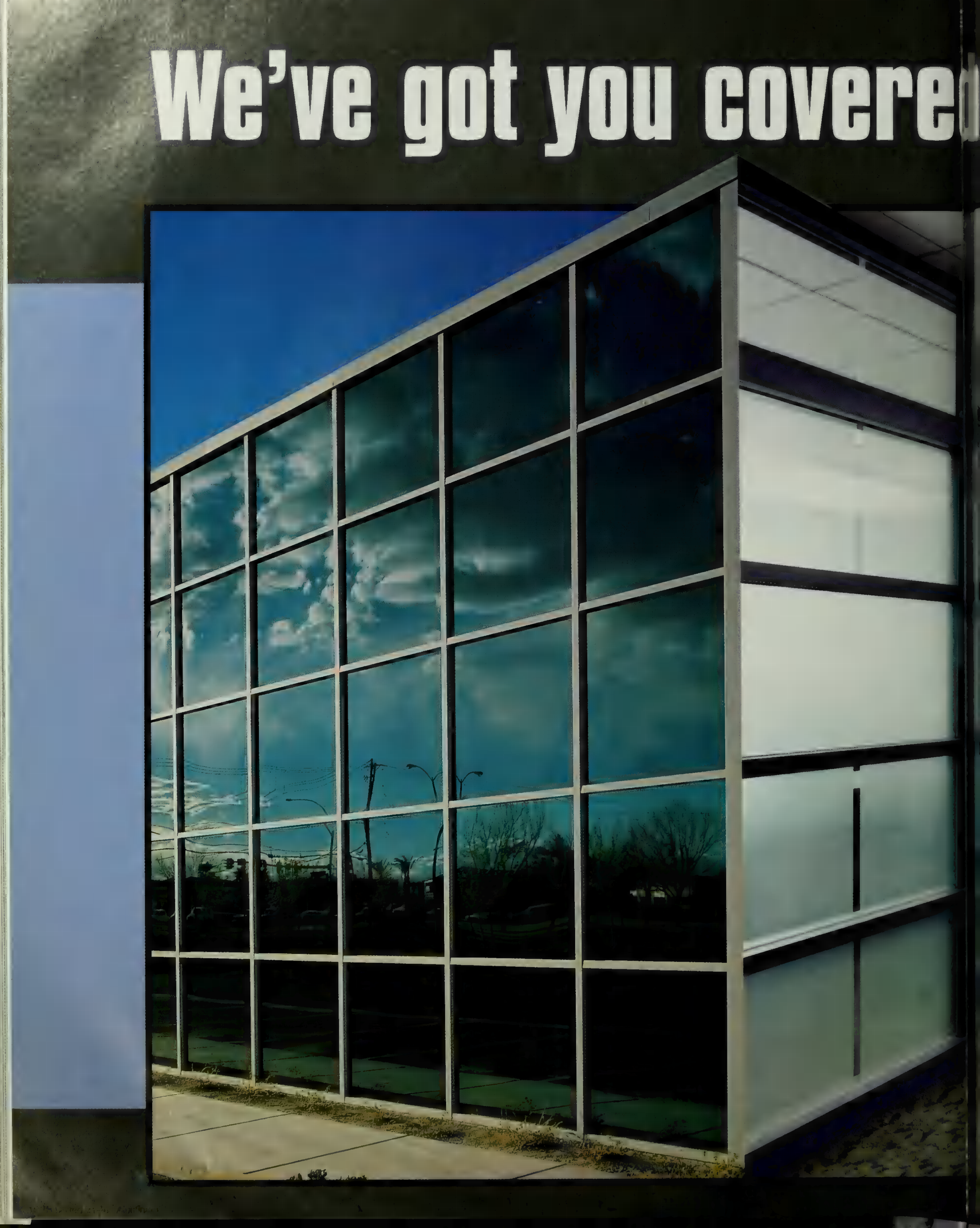
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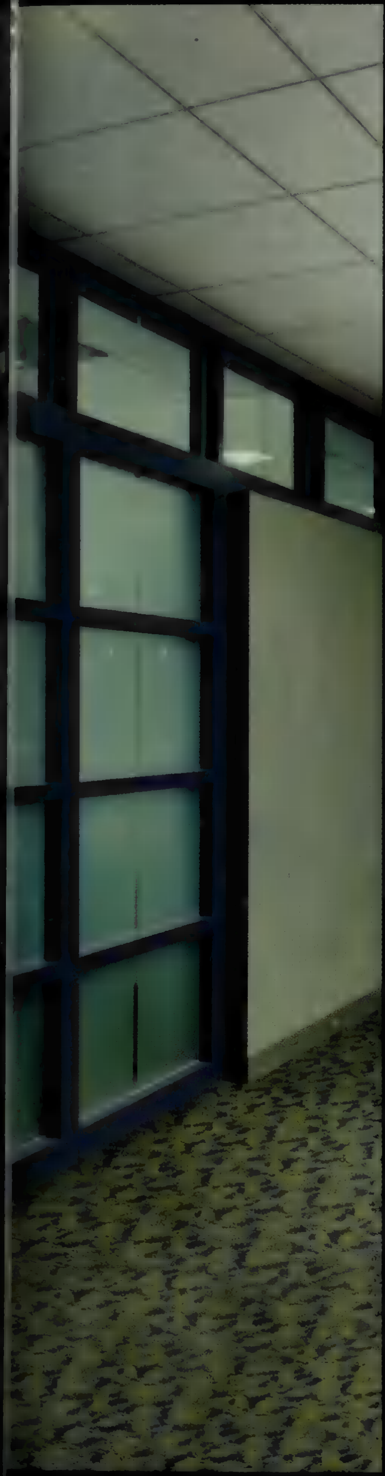

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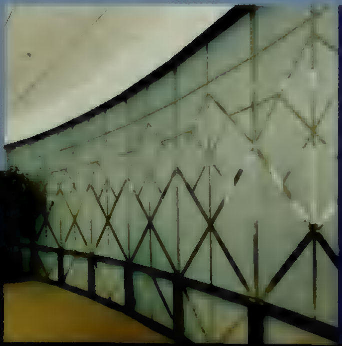

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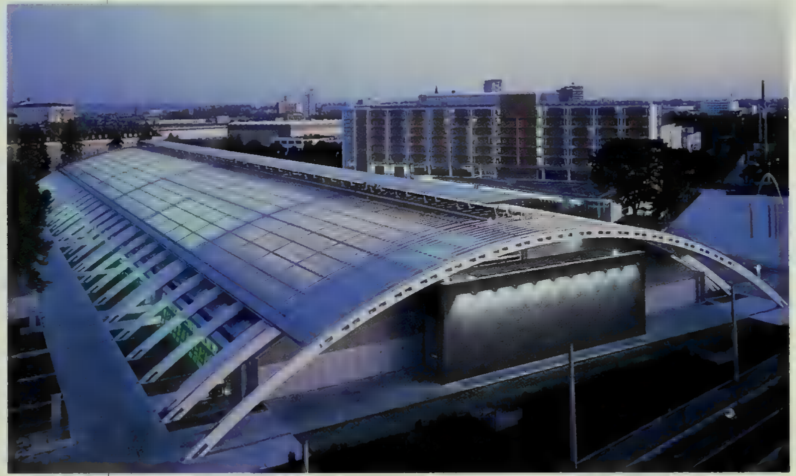
CIRCLE 39 ON INQUIRY CARD

# Improving Glass Performance

## NEW FILMS, COATINGS, AND LAMINATES MAKE GLAZING SAFER, STRONGER, AND MORE ENERGY-EFFICIENT WITHOUT SACRIFICING TRANSPARENCY.

**by Stephen H. Daniels**



**The Design Center in Linz, Austria, has a laminated glass roof that evokes crystal palaces (above). The expansion of McCormick Place in Chicago (left) is clad with low-e glass.**

Glass, so delicate, so ethereal, has become a rigorous building material, something that can be buffeted by windblown debris, engulfed by flames, stomped on, even pounded by heavy objects—all without cracking, chipping, or losing its transparency. Glass can be relied upon to reduce security risks, curb energy consumption, and lower building operating costs, all while looking sublime. Glass can be brilliant, colorful, richly textured, even sculptural. And it can be as easy to maintain and as cost-effective as concrete or metal.

"With glass you can create illusions that cannot be accomplished with any other material," says materials and design consultant Michelle Andrews. "We've used more glass in the past two or three years than at any other time, thanks to its insulative value, variations in design, a newfound clarity, and finishes that make it easier to maintain."

There's no doubt that glass, used in roofs, canopies, custom skylights, curtain walls, and atriums, is more desirable than ever. The demand for architectural glass has risen steadily over the past five years and, almost without exception, the major manufacturers are expanding their facilities to meet that demand and to gear up for new technology. Europeans still use five times the amount of architectural glass that Americans do. That's thanks to the promotional efforts of the major overseas glass companies, as well as a stronger tradition of using structural glass and more lenient code requirements. "But Europe and Asia lag in the development of coatings," says Robert Heintges of R. A. Heintges Architects Consultants. "As a result, we're catching up."

Glass is made in much the same way today as it was 40 years ago when the float glass process was invented. Molten silica is poured onto a bed of molten tin, where it remains until it hardens. The result is glass that is perfectly flat and clear. Refinements in technology have made the glass available in thicknesses ranging from 1/16 inch to one inch. Rolling the glass in a semimolten state creates patterns. Introducing various additives to the silica produces colors, tints, and other effects. Cobalt oxide turns glass blue. Cobalt and nickel neutralize other metals and make glass colorless. Iron produces an aquamarine cast but adds strength. Reducing the amount of iron creates glass that is less reflective and therefore appropriate for retail applications. Phosphorus makes glass opalescent. Many companies have their own formulas for achieving different effects.

The mechanical properties of glass can be altered by heat strengthening or tempering. By reheating and then quickly chilling the glass, it is made anywhere from two to six times stronger than untreated glass and able to stand up to greater temperature extremes. The drawback to tempered glass is that when it does break, the fragments are small and, consequently, dangerous. Glass can also be chemically treated for strength, which makes it suitable for paving or flooring. Safety glass is made by sandwiching glass between layers of plastic. Security glass consists of glass layered with sheets of various plastics, usually polyvinyl butyral (PVB), though newer, tougher plastics are on the horizon. The addition of these layers reduces sound transmission as well.

*Stephen H. Daniels is a freelance writer specializing in building technology and construction. He lives in the Seattle area.*

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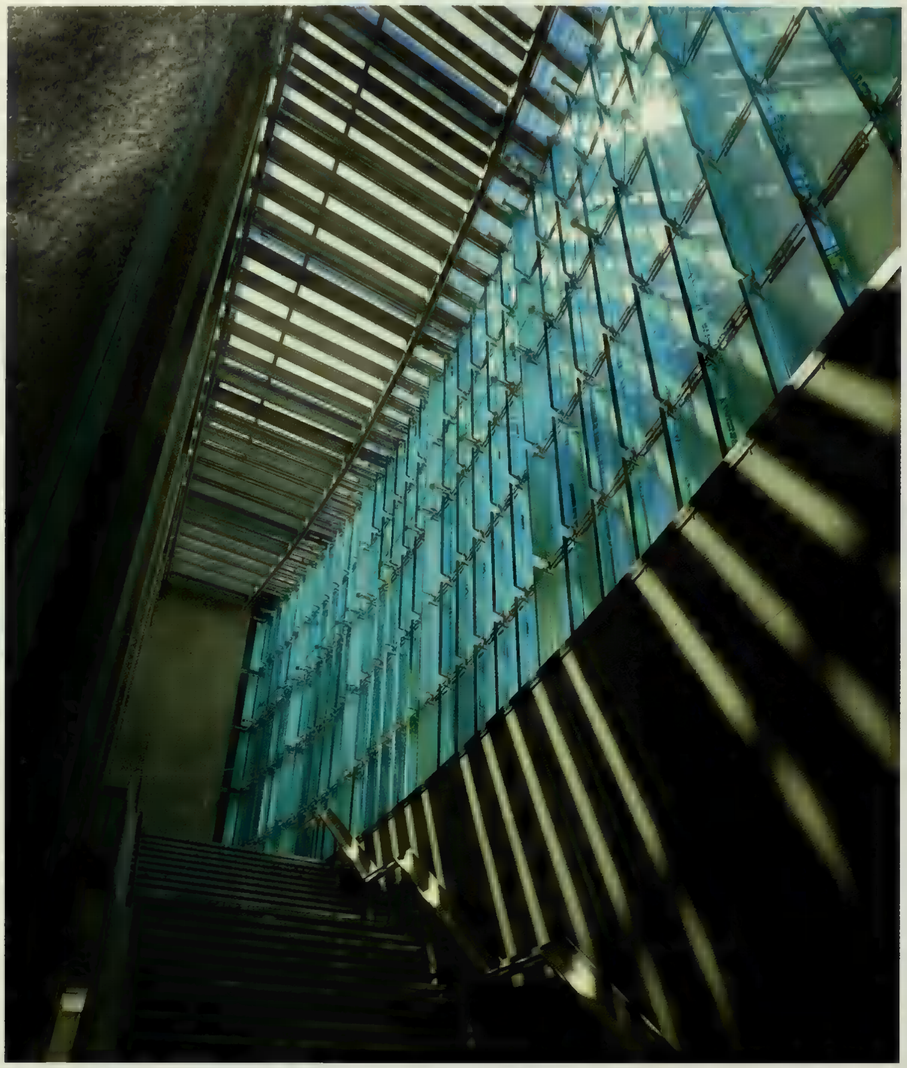
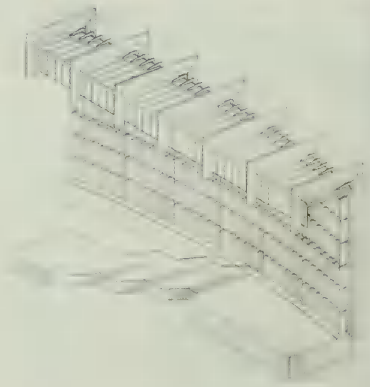
**Continuing Education** *Use the following learning objectives to focus your study while reading this month's ARCHITECTURAL RECORD/AIA Continuing Education article. To receive credit, turn to page 196 and follow the instructions.*

**Learning Objectives** *After reading this article, you should be able to:*

1. *Describe how films, tints, and textures extend the range of applications for glass.*
2. *List the additives that change the color of glass.*
3. *Describe what low-emissivity coatings do for glass and how they are applied.*
4. *Explain how the properties of glass can be altered, and how these alterations affect how glass absorbs or reflects heat.*





**The First Hawaiian Bank has two parallel glass exterior walls: the outside skin is the weather wall, while the translucent interior wall (above left) acts as a "projection screen showing the changing qualities of light," says James Carpenter. Glass prisms (above right) contribute to the vertical support system.**

PHOTOGRAPHY: © DAVID FRANZEN

But the biggest advances in glazing are the films, now virtually transparent, that are layered on the surface of the glass or integrated during manufacture. They have the ability to selectively reflect or absorb different types of solar energy. Used together with tints and laminates, these films significantly extend the range of applications for glass. As a result, the architect's quest for glass that is truly clear, nonreflective, minimizes heat transfer, and resists impact may not be so elusive, says Michael Flynn of Pei Cobb Freed & Partners. "The industry is not far from achieving this seemingly contradictory set of of criteria."

### Boosting energy efficiency

Low-emissivity, or low-e, glass has almost single-handedly spurred innovation in the industry. Introduced in 1989, low-e was intended for cold climates, where it reduces energy loss by reflecting heat back into a living space. It is equally effective in Sunbelt applications, where it limits heat gain by reflecting radiant waves. Though until recently low-e cost four to five times more than untreated glass, the price has dropped as the manufacturing process has been streamlined; it now costs about $1 more per square foot than normal glass. Representatives for the glass industry say low-e will be the norm on every building within the next five years.

More recently, manufacturers have introduced spectrally selective coatings, applied as part of the low-e coating. These permit some portions of the solar spectrum to enter a building while blocking out others, including infrared and ultraviolet radiation. By limiting solar heat gain in the summer, preventing loss of interior heat in the winter, and allowing occupants to reduce electric lighting by maximizing daylight, the coatings reduce energy consumption—all without tinting the glass, making it reflective, or significantly compromising transparency.

"If it weren't for these advanced coatings, the percentage of glass we can use on a building by code would be significantly less," says David Van Galen, AIA, of LMN Architects. At the new Boeing Commercial Airplane Group Headquarters outside Seattle, energy codes would have allowed only six feet of glass per floor. "With the newest low-e glasses, we were able to include more glass, collecting light and views of the surrounding park."

Architects are overcoming their reliance on reflectivity and tints as the first line of defense against solar gain, Flynn says. Reflective glass "sacrifices visual warmth for energy gain," he says. It also reduces the amount of daylight that can enter. New low-e films make reflective glass less critical, though it is still favored by some clients for its privacy and flashiness. To Flynn, though, "Absolute transparency, or as close to it as you can get, is more desirable."

Tints and coatings can be added to make the glass absorptive, again limiting the amount of infrared waves entering a space—this time by absorbing the waves instead of reflecting them, as spectrally selective coatings do. Mixing some additives into the glass, often cerium oxide, which gives the glass a light tint, increases absorption. Colored glass absorbs solar waves from across the spectrum, lessening the amount of light and heat entering the space.

The microscopic layers of metal oxides that compose low-e and spectrally selective films are generally applied to the glass in two ways. Sputtering, or vacuum deposition, ionizes the metal, depositing it on the glass in a thin film. Because this is a low-temperature process, low-e can be sputtered onto plastic, making it suitable for laminated glass or for use in the new retrofit films, applied over existing glazing. But sputtered coatings, because the metals are exposed on the surface of the glass, can be damaged. A second method is the pyrolytic process, in which oxides are applied to glass while it is still molten, making the coating integral to the glass.

The result of these innovations—and what many architects don't realize—is that a building with a properly glazed facade that includes these new coatings can have a lower annual heating and cooling load than one with an R-19 insulated opaque wall, says Steve Selkowitz, head of the building technologies department at Lawrence Berkeley National Laboratory. In cold climates, that's true even when glass is placed on the north side. During the winter coated glass can gather more thermal energy than it loses over a 24-hour period.

**Security and safety**

Recent code restrictions have changed the way glass can be used in a building. Laminated glass, always necessary for overhead glazing, is now increasingly used in vertical glazing. And blast-resistant glass is often required in federal buildings and courthouses, and occasionally in buildings overseas. Making glazing resistant to storm damage, break-ins, bombings, and fire involves multiple layers of glass and plastic. PVB is the most commonly used interlayer because of its affordability and transparency. It's also compatible with low-e and spectrally selective coatings.

When it comes to security, there's little substitute for glass thickness. Still, manufacturers are striving to make glass lighter, more transparent, and at the same time stronger. DuPont, for example, recently

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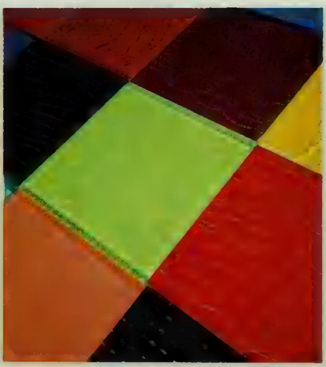
**Pilkington Planar Systems** W&W Glass Systems (left), Pilkington's U.S. representative, completed 11 canopies, covered in clear and fritted laminated glass, for the San Francisco Municipal Railway. 800/452-7925.



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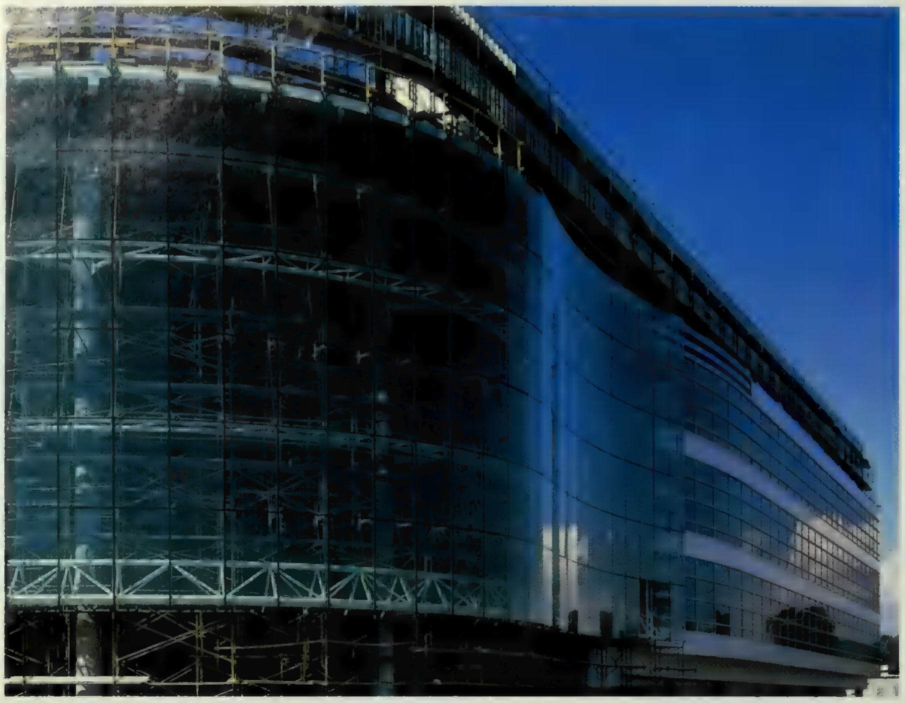

**Using new low-e coatings and fritted glass significantly reduced solar heat gain, allowing LMN Architects to use a much greater expanse of glass than what codes would have allowed otherwise (left). "Super transparency was very important to us here," David Van Galen says. Low-e glass, tinted green for aesthetic reasons, was used on New Jersey's Parsippany Commons (above). Fritting reduces glare and limits solar gain.**

introduced a Surlin-based plastic interlayer for hurricane glass. The material is tougher and more effective at stopping projectiles than PVB, though it is also more expensive. Companies are also working to make security glass architecturally acceptable, says Steven Wetzel, director of marketing for Viracon. A new generation of bullet-resistant glass, made with interlayers of polycarbonate, now looks the same as standard glass. That's important when designing a courthouse, for instance, where the judges' chambers must be glazed with bullet-resistant glass but the rest of the structure uses standard architectural glass.

### Decorative and practical

At the Boeing headquarters building, LMN Architects used fritted glass—in which crushed glass is melted onto the surface of the float glass, providing various levels of opacity or color—to screen out glare and limit solar gain. As the serpentine wall sweeps to the west, the glazing becomes increasingly opaque, while to the north, the glass is transparent in order to gather light.

"Even with the advanced coatings, all the glass we used would not have been possible energy-wise without the fritting," Van Galen says. The slick, durable surface of fritted glass makes it easy to clean and resistant to oil and water stains. Fritted glass is also more reasonable in cost and more widely available than sandblasted or acid-etched glass.

Sandblasting does allow detailed custom designs, but dirt can lodge in the pockets that the pummeling sand produces. A better choice is often acid-etched glass, which diffuses light and has a silky appearance. Slumped or cast glass, made by heating glass almost to its melting point and laying it into a carved mold, gives interesting custom patterns; rolled glass provides a more consistent texture. The former is, however, unpredictable in its load-carrying abilities. Both are used to provide privacy, reduce glare, and create unusual optical effects. Working with various adhesives, companies like Architectural Glass Design in Napa, California, sandwich metal, paper, painted elements, or even fused or blown glass between layers of tempered or laminated glass.

### The future of glass

James Carpenter, AIA, uses glass as a structural material in much the same way other architects select concrete and brick. He's learned that glass is strong in compression, but not as effective in tension; his structures separate these two forces and capitalize on compressive strength. Structural components are made of laminated glass—if a piece fractures, the glass will hold together sufficiently to retain its structural qualities until it can be replaced. Using laminated glass also means that shards won't fall out and injure someone.

At the First Hawaiian Bank Building in Honolulu, Carpenter paired two glass skins to create a 100-foot-long, 48-foot-high glass wall. This is supported with glass columns that are post-tensioned against one another and braced horizontally. "The goal was to build a totally transparent clear glass wall in an extreme, sunlit environment," he says. Doing so would have been impossible a few years ago; occupants would have "fried" and security would have been an issue. "Glass companies want architects to push them to the limit to see what they can do," he says.

There's even more significant progress to come. "Glazing will become intelligent, able to react to the environments within and without," Selkowitz reports. Scientists are experimenting with photochromic glass, which darkens when certain levels of light are reached. They are also looking at ways to put photovoltaics within glass to harvest solar energy.

But the technology that holds the most promise and is the most imminent is electrochromic glazing. This automatically adjusts its translucency in response to changes in heat and light. Consisting of a multilayered, thin film applied to glass or plastic, electrochromic glazing is controlled by low-voltage current. Linked to the building's HVAC system and lighting controls, the film changes from clear to increasingly dark. Reversing the current returns the film to clear. The ability to transform the window into a semitransparent or opaque wall gives architects a whole new design avenue while controlling energy flow in the entire building envelope. Electrochromic technology, now under development, will be available within the next three to five years. ■

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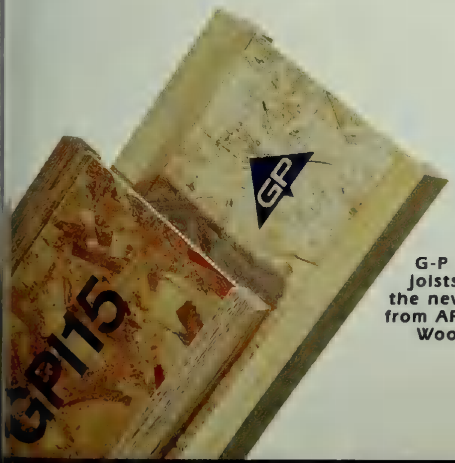

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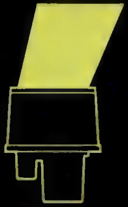

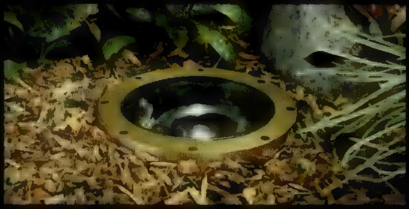

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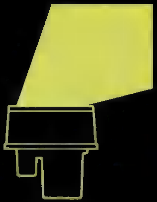

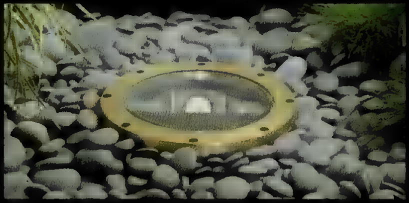

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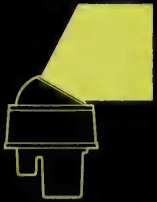

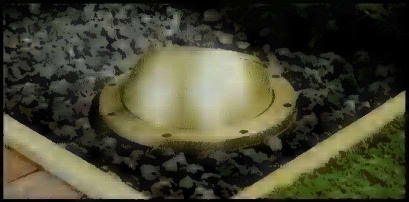

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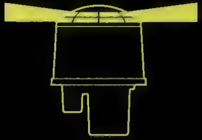

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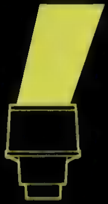

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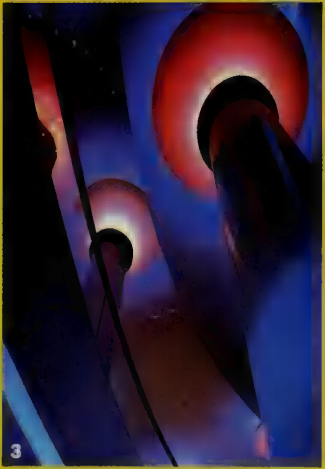
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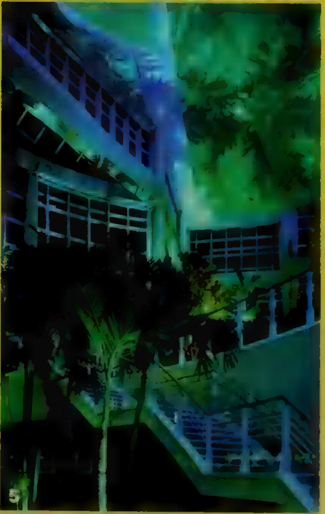
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# LIGHTING...

*Those of us who produce architecture magazines never forget that what we put on paper is only as good as the work designers submit to us. On the other hand, no designer who submits material does so without risks: the project may be rejected, the facts may be misinterpreted, the work may be misunderstood.*

*When I edited my first lighting magazine in 1986, a number of lighting designers told me that they wanted to see how the magazine was going to turn out before they submitted their work. This was discouraging, but eventually my lucky break came when a lighting designer named Craig Roeder called me out of the blue and asked if I would like to publish a project he had just finished. In his extremely enthusiastic way, Craig promised me that the Lloyd Paxton Gallery in Dallas would be the blockbuster project I needed to get my magazine off the ground, that it would garner the envy of designers and the financial support of advertisers everywhere.*

*He sent the transparencies to me overnight, and the project did not disappoint. The gallery was loaded with the kinds of features that make architectural lighting interesting to look at and read about. The project leapt off the pages, helping to prove to everyone that lighting could be presented in a way that would be meaningful to architects.*

*This was the beginning of a long association between Craig and myself. During my years with that magazine and for the eight and a half years I've edited the lighting section of* RECORD, *it seemed that he did a really interesting project—a "must publish" work—at least once a year. He would never tell me about these projects beforehand. Instead, he would call to announce, in a giddy voice, that photographs of a new project would arrive the next day. Then he would try to convince me to put his project, sight unseen, on the cover. I never promise a cover, but in the end he did get a few of them.*

*Craig passed away on June 16 at the age of 48. There are two things about him I will miss the most: his passion for lighting and his great creativity. I didn't speak to Craig that often; he traveled a great deal and it was hard to catch him in his office. But every once in a while, I would get a postcard from him. Although he never wrote much, the cards were always signed "LOVE AND LIGHT, Craig."*—Charles Linn, AIA

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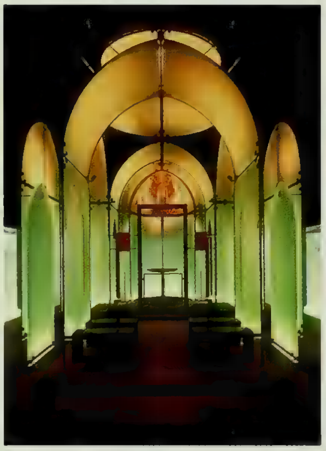
*Lighting design projects by Craig Roeder: Interstate Tower, Charlotte, North Carolina (1); Health Central, Orlando, Florida (2, 5); Le Bonheur Children's Medical Center, Memphis, Tennessee (3); Lloyd Paxton Gallery, Dallas, Texas (4).*

# CREATIVE USES

## LIGHTING ENHANCES BYZANTINE FRESCOES IN 20TH-CENTURY CHAPEL

The Byzantine Fresco Chapel in Houston has received widespread attention for its architecture, but lighting also plays a crucial part in its success. Located at the de Menil Foundation, the structure was designed by architect François de Menil, and its lighting was designed by Paul Marantz and Barry Citron of Fisher Marantz Renfro Stone.

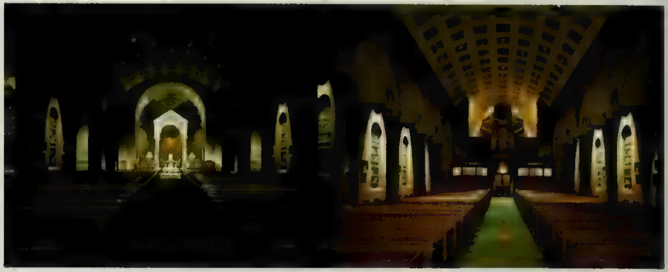
The proportions and form of the building's translucent glass walls were inspired by the two frescoes to be housed there, which were originally part of a small chapel on the island of Crete. The engineering firm Ove Arup and Partners designed the metal-tube structure that supports the glass and also conceals wiring for the fresco lighting.



Because the space is used as both a museum and a chapel, the lighting designers faced several challenges: to create a space with a luminous, spiritual quality; to provide proper illumination for viewing the frescoes; and to conceal the lighting equipment from view.

The chapel was constructed within a concrete room. Inside, the floor, upper walls, and ceiling are made of steel and finished in black. Adjustable fixtures fitted with spread lenses were concealed in the black portion of the walls and suspended from the ceiling. These backlight the glass arches and the upper part of the glass walls. Fluorescent strips were recessed into the concrete floor to edge-light the lower portion of the glass walls and shielded to prevent glare. The unfinished concrete perimeter walls are also uplit from the floor by fluorescent lamps.

Custom-made miniature MR16 fixtures anchored to the metal structure uplight the frescoes. The lighting levels can be adjusted using a preset dimming system.



## NEW LIGHTING SYSTEM SHINES INSIDE REMODELED HOUSTON CATHEDRAL

After almost 60 years of service, St. Anne's Catholic Church in Houston has received an inspired restoration and remodeling by Ray Bailey Architects and a new lighting system designed by Michael John Smith.

Before the church—designed by Maurice Sullivan in 1939—was remodeled, it was illuminated by pendants suspended from the nave and a pair of sconces high up on the transept walls flanking the sanctuary. "The pendants were the brightest objects in the space," says Smith, "so the glare made it difficult to see."

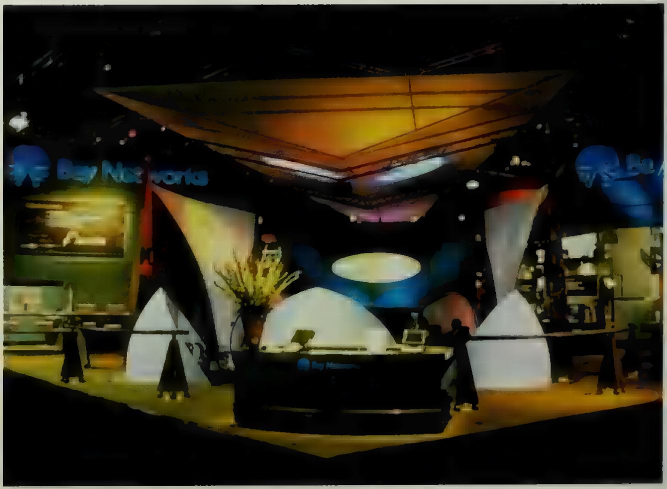
Recessed adjustable accent lights were installed in the nave's barrel-vaulted ceiling and aimed downward to light the pews and the center aisle. "The stained-glass windows in the side aisles were so bright that the walls around them went black," says Smith. To compensate, adjustable recessed PAR56 medium floods were put over each window to balance out the daylight streaming in. The vault over the sanctuary is lit by uplights recessed into the floor, and the baldachino is crosslit by track lighting concealed behind the narrow walls that support the arch separating the sanctuary from the nave.

Smith specified a 16-scene preset dimming system for the church, with each scene programmed for a different type of service: for example, there is a scene for weddings (above left) and one for masses (above right). According to Smith, the most exciting moment of the project came immediately after it was completed, during an Easter Gloria service. When the lights came up from complete darkness to full intensity, they revealed the newly cleaned mosaic walls and the renovated church to the congregation for the first time. "It was so beautiful you could hear the people gasp," says Smith.

## TRADE SHOW EXHIBIT LIGHTING PUTS COLLABORATION IN SPOTLIGHT

Lighting designer Steven Rosen, of Available Light, explains that the trade show exhibit for Bay Networks needed to be "very warm, welcoming, and classy." He says that his goal was to make the lighting an organic part of the booth design, noting that exhibit designers, lighting designers, and multimedia producers often work too independently on exhibit designs, resulting in lighting that has a pasted-on look.

To create several spaces within the booth, exhibit designers Folio Exhibits used dividers and a large triangular canopy made of translucent materials. The dividers are painted with ever-changing color-saturated light from Fresnels and ellipsoidals hung from overhead trusses. Symbols and logos that are part of Bay Network's marketing message are also projected onto these surfaces. Videotapes shown in a small theater have a special track that cues a computer to create lighting effects that correspond to what visitors are seeing and hearing.



PHOTOGRAPHY: © PAUL WORCHOL (LEFT); FRANK MARTIN (TOP RIGHT); STEVEN SLATKIN (BOTTOM RIGHT)

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CIRCLE 47 ON INQUIRY CARD

# Fire & Ice Restaurant Sizzles with Hot and Cool Color and Light

### by Russell Fortmeyer

Although themed restaurants—where entertainment is as significant an attraction as the cooking—are all the rage now, the owners of the new Fire & Ice restaurant in Cambridge, Massachusetts, decided to keep their focus on food. Instead of loading a space up with sports memorabilia or movie props, they wanted the design of their flagship restaurant to showcase an innovative concept for the kitchen: the "improvisational grill." At Fire & Ice, patrons use their plates like painters' palettes, assembling their own meals from ingredients available at various food stations, then handing them over to chefs who cook them at a central grill.

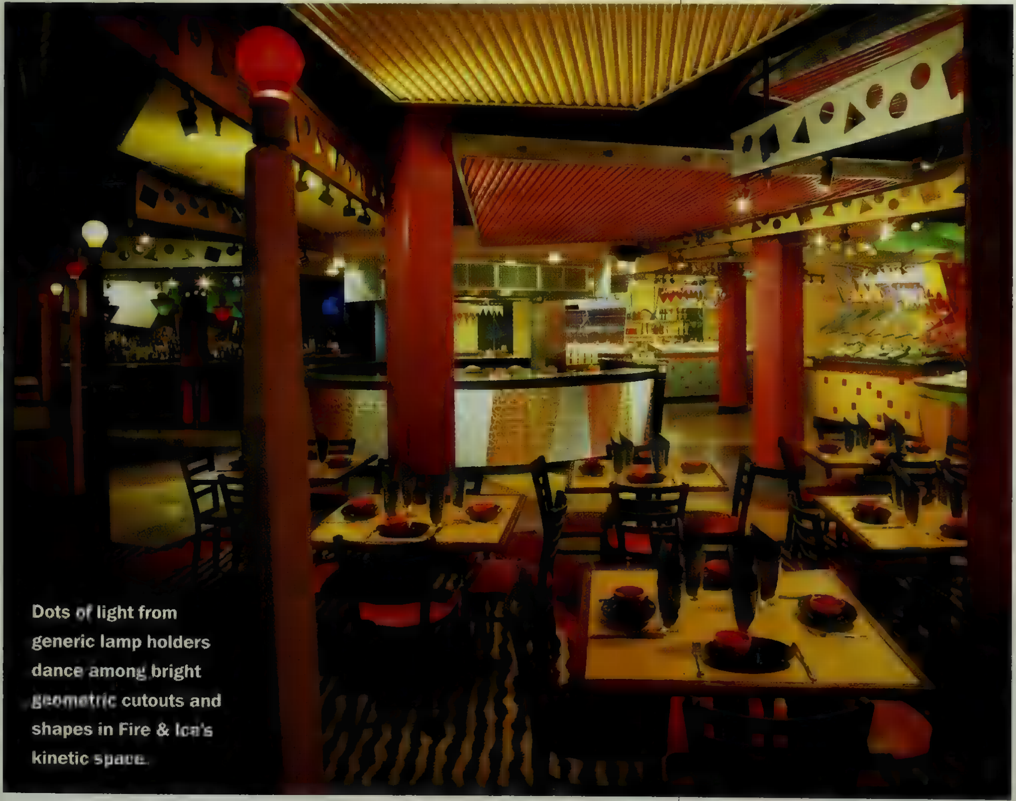
Taking cues from the impromptu nature of this dining experience, architects Prellwitz/Chilinski Associates created an 8,000-square-foot restaurant that could easily be mistaken for a nightclub. From the cool atmosphere of the bar near the entrance to the warmer, animated rear dining area and courtyard, the design is a collage of moods and colors. Paths of light lead diners through the space, while color is used to create the sensation that some areas of the restaurant are warm and others cold. The contrasts energize the dining room, creating a festive atmosphere. Suspended, corrugated metal cut in angular shapes, and metal panels punched with geometric shapes have been painted in bright, high-energy colors. These elements are reinforced by an unconventional lighting system partly fashioned out of generic and found lighting components.

Partner-in-charge David Chilinski says his primary goal was to "craft an environment that would get people involved." A cascade of colorful wall panels leads patrons down from street level to the 235-seat restaurant. The entire space is an integration of its parts; the colors of the food are picked up in wall panels and furniture, and again in the lighting. Reflective textures, spirally sanded metal laminate, a radiating floor pattern, and a kinetic, industrial chic is intended to encourage patrons to busy themselves concocting their food. An open-ended circulation arrangement invites them to meander through the food stations in no particular order.

"Because Fire & Ice is a restaurant based on participation, the owners wanted a sense of excitement, liveliness, and dynamism in the space," says Mark Connor, project architect. "We wanted to come up with an image that wasn't theme-based but was still very lively."

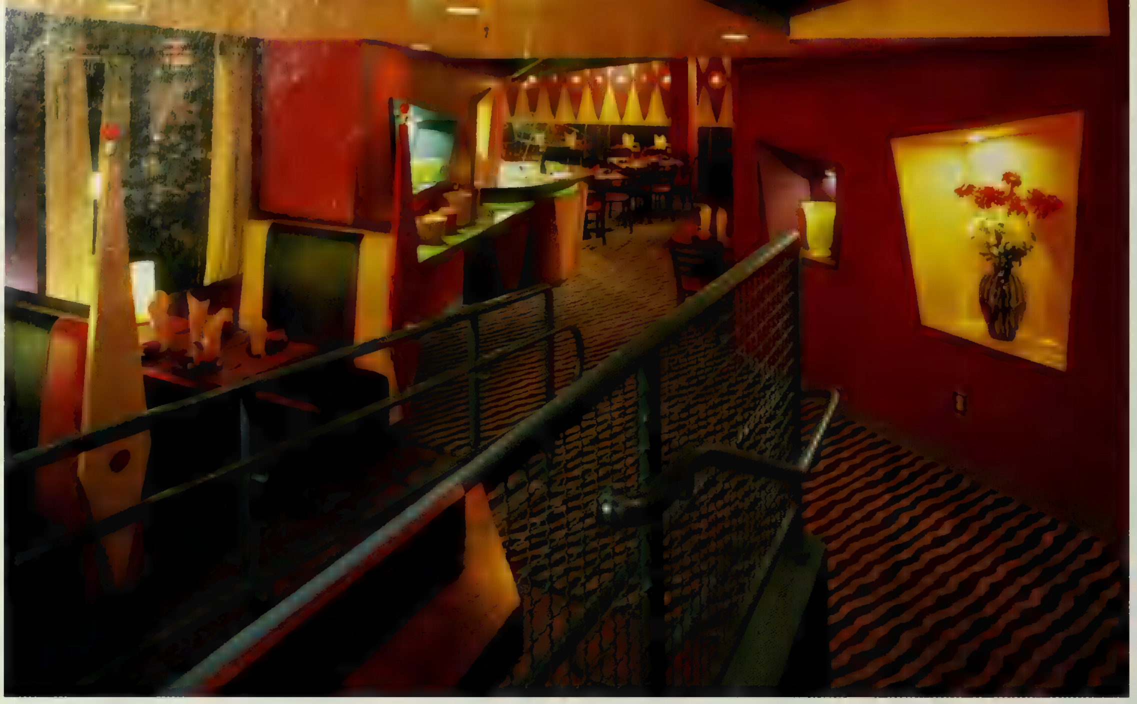
While the architects worked in this vein, the lighting design was kept relatively simple and economical but with a few

*Russell Fortmeyer studies architectural engineering with an emphasis on lighting design, and frequently writes about architecture and urban planning.*



Dots of light from generic lamp holders dance among bright geometric cutouts and shapes in Fire & Ice's kinetic space.

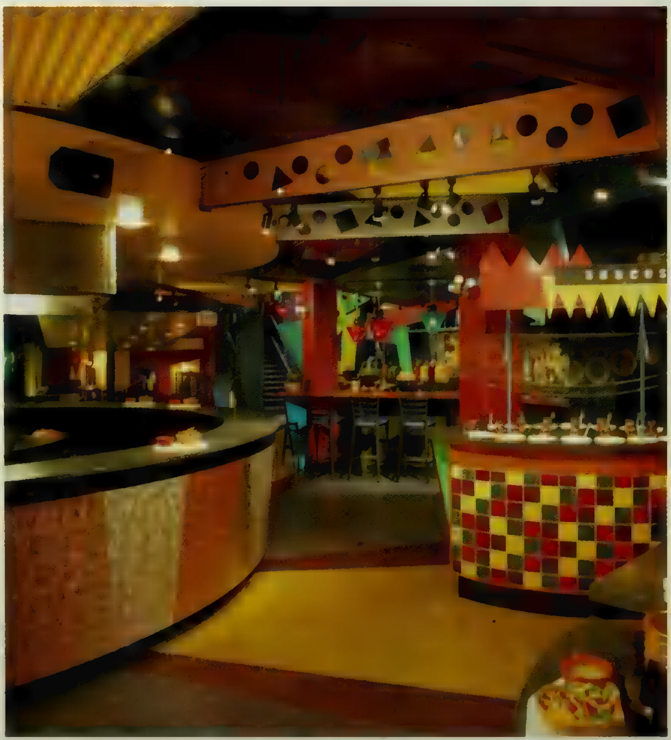
**Project:** *Fire & Ice, Cambridge, Massachusetts*
**Owners:** *John Schall and Jim Miller*
**Architect and lighting designer:** *Prellwitz/Chilinski Associates—David Chilinski, partner-in-charge; Mark Connor, project architect; Susan Greco, interior design; Chris Brown, designer*
**General Contractor:** *Shawmut Design & Construction*
**Electrician:** *TriState Electric*



Recessed downlights with halogen sources light paths and vitrines containing vases and cut flowers. The architects' intent was to light selectively, rather than washing all of the surfaces in the space with light.

surprising twists. Incandescent pendant lighting in the entry and bar area is provided by conventional desk lamps Connor bought in a local store and simply turned upside-down and hung at various heights from tracks. The shades are clear acrylic and translucent vinyl punched with geometric patterns.

"It's a lot of fun to take these objects that people have in their houses and transform them into something that is uncommon," says Connor. Along the high walls of the bar and on architectural fragments in the dining room, a series of red, blue, green, and yellow A-lamps in porcelain sockets "dance," as Connor puts it, across the surfaces. The food stations and grill area are lit with halogen lamps on tracks, which echo the "fire" of the eight-foot-diameter central grill. An outdoor courtyard that seats 45 is lit with caged, bare-bulb construction lights fixed to cables; the layout of bricks in the courtyard's terrace mimics the radiating pattern of the interior dining room ceiling, which is accented with strands of linear fiber-optic lights. Both inside and out, though, lighting is used selectively, bounced on and off different areas, as opposed to illuminating every surface evenly.



Connor says much of the lighting design occurred during the construction process, which suited the architects' desire for the restaurant to have a spontaneous, almost happenstance appearance. In particular, the pendants and the spotlights in the dining area were installed in tracks wherever possible for maximum flexibility. Some of the tracks are on simple dimming systems, but there's no sophisticated control system for employees to manage. Connor says he approaches restaurants very much like theatrical set design: because trends and ideas in restaurant design evolve quickly, it's important to create an impact without spending a lot of money on materials that aren't going to be around forever.

Since its opening almost a year ago, the restaurant has been a hit—both gastronomically and socially. "The energy of the concept combined with the lighting and the colors puts people in the mood to do something experimental," explains Chilinski. Jim Miller, who co-owns the restaurant with John Schall, believes that good design and good food must be combined in equal parts to assure a restaurant's success. "Fire & Ice's design genuinely reflects the restaurant's unique approach to food service," he says, "rather than being a place that serves so-so food but tries to get by on a themed design." ■

**Sources**

**Desk lamps:** *Crate & Barrel*

**Track lighting and mono-points:** *Juno*

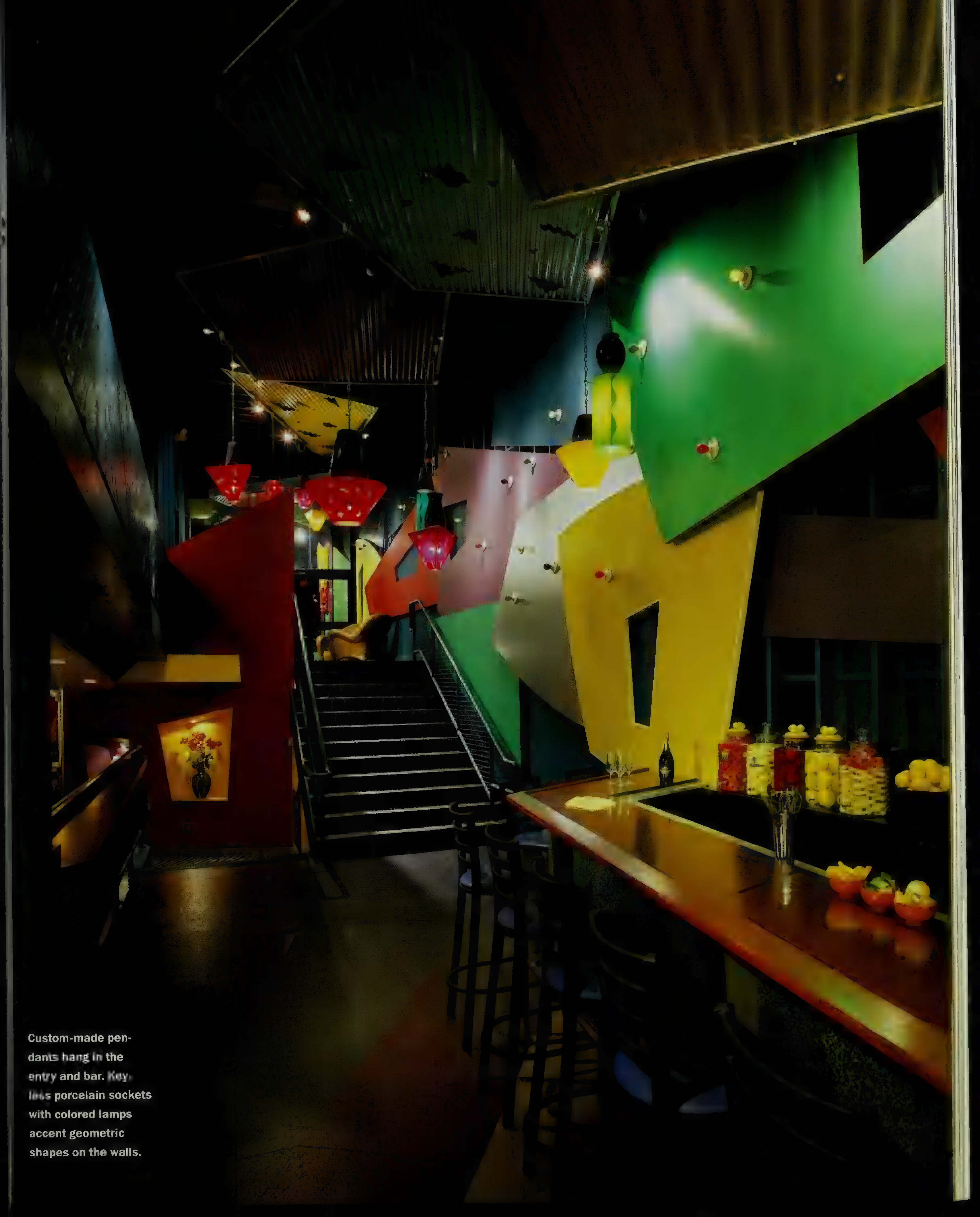
**Keyless porcelain sockets, galvanized floodlight bases, and metal construction guards:** *Leviton*

**Lamps:** *General Electric*

**Custom pendant bases:** *Prellwitz/Chilinski Associates*

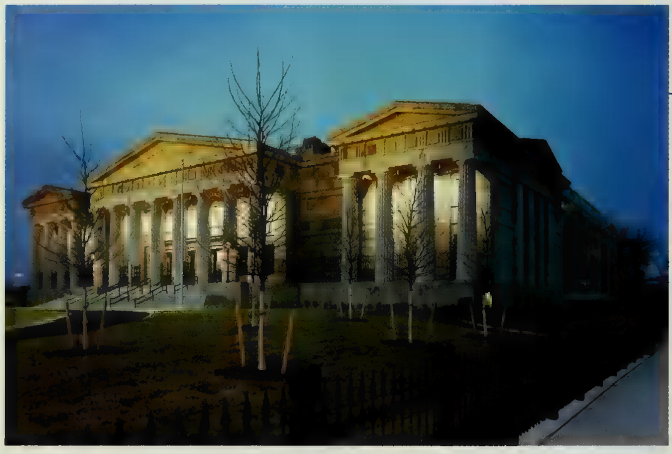
**Custom pendant shades:** *Addsource*

**Fiber optics:** *Lumenyte*



Custom-made pendants hang in the entry and bar. Keyless porcelain sockets with colored lamps accent geometric shapes on the walls.

# A New Light Brightens a High School for Creative and Performing Arts



**by K. Schiffman**

**Outside, CAPA is lit by pole-mounted metal-halide fixtures. Extra light is focused on the pediments. Columns are backlit by surface-mounted metal-halide wallwashers. Reproductions of the original lanterns hang over the entry of the building.**

Philadelphia's Ridgway Library has been touted as one of the most significant pieces of Greek Revival architecture in the United States. Designed by Addison Hutton and built in the countryside south of the city in 1878 by Dr. James Rush and his wife, Phoebe Ridgway Rush, it was to be a private subscription library located in what they believed would be the next area of town to flourish. Unfortunately, the north end of the city became fashionable instead, and the library experienced limited success. In 1966, when the Library Company moved out, the building was sold to the City of Philadelphia, and when no suitable use for the massive main hall and reading rooms could be found, its windows were bricked up and the lower level was converted into a recreation center for residents of the somewhat depressed South Philadelphia neighborhood.

One hundred twenty years after its birth, the imposing structure at Broad and Carpenter Streets has finally come into its own. Last year, the Ridgway Library was transformed into the Philadelphia High School for the Creative and Performing Arts (CAPA), anchoring the portion of Broad Street that is now being called the Avenue of the Arts. CAPA's 600-odd students had originally been crammed into an old junior high school built to accommodate three-quarters of that number. A few years ago, the story goes, the heads of several organizations—Connie Clayton, former superintendent of schools; Wilson Goode, former mayor of Philadelphia; and Bernard Watson, president of the William Penn Foundation—ran into each other at a cocktail party and hatched a plan to resurrect the underutilized library building by turning it into a new CAPA.

As a restoration project, CAPA was an architect's dream—and that of a lighting designer as well. Alfred R. Borden IV, of the Lighting Practice, Inc., in Philadelphia was the lighting designer for the project. For years, he says, whenever he drove past the grand, imposing library he imagined how the exterior of the building might one day be lit.

Borden believed that a building of such mass and drama represented high ideals—perfect for a school. From the start, his idea was to make the structure glow with the ethereal light it deserved. "It called for a dreamlike quality, like it was floating," says Borden. Even though contemporary lighting equipment would have to be added, Borden's goal "was really to illuminate the space as it once was, not to add something that was not previously there. Inside the building, the goal was to keep the lighting warm and soft-edged, and to feature all of the decorative elements."

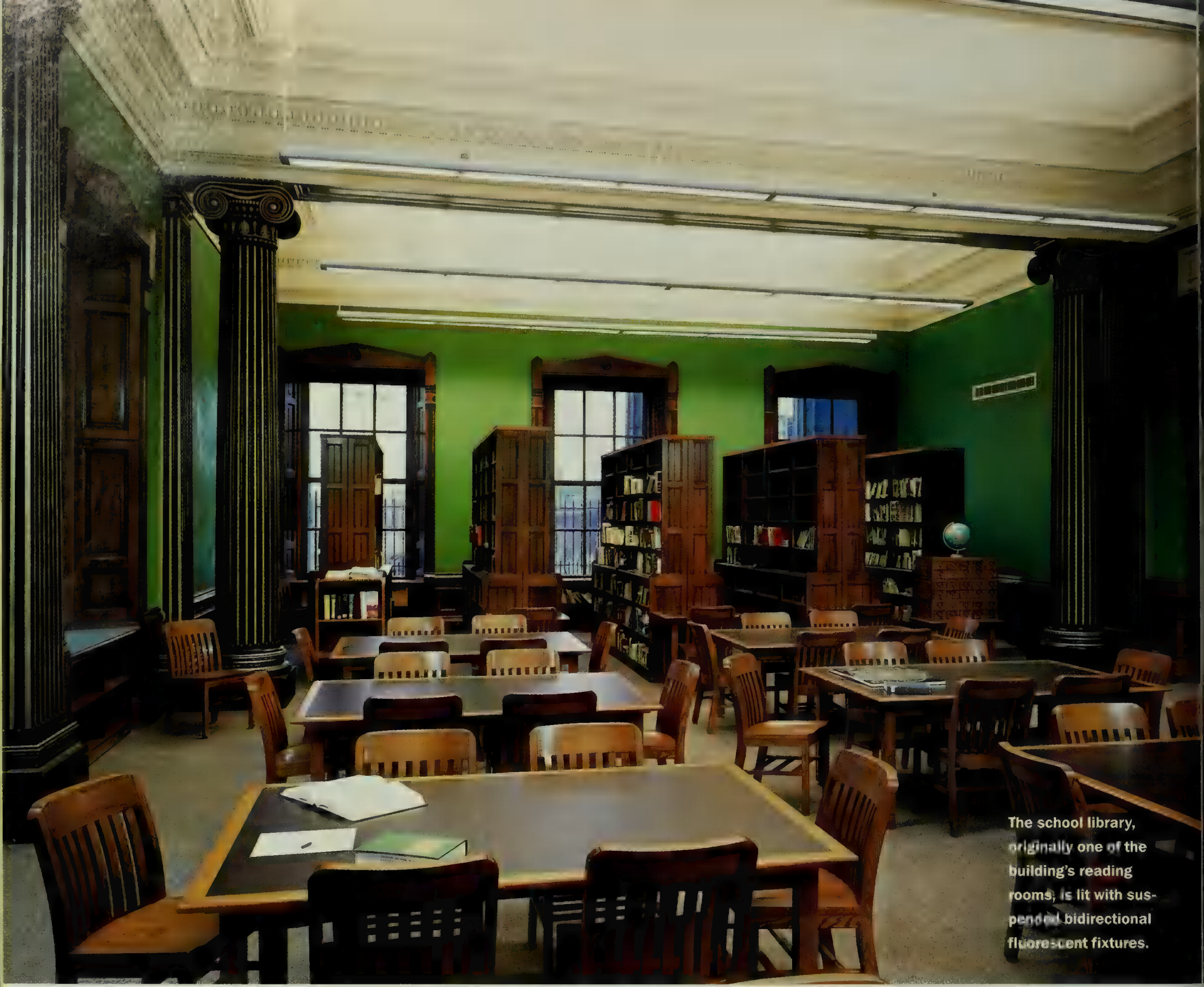
The principal architect, James Bennett Straw, AIA, of Kise Straw & Kolodner, was intent on restoring as much of the building as possible to its original splendor. "When we took over the building, the upstairs had been vacant since it was closed," says Straw. "Pure restoration is done primarily for interpretive purposes, to bring a space back to its original appearance. In most parts of the building, that was not possible because the uses of the rooms were going to change. Where this occurred, we did derive the new appearance of the rooms from the original."

One stroke of luck was that the library had never had a lot of money to make improvements, so parts of the building, though worn, had not been completely destroyed or removed. The color, for instance, was relatively easy to restore. Straw had a paint analysis conducted so the original Greek Revival color palette of Etruscan red, orange, cream, and black could be exactly matched. Architecturally, the main hall had retained its original structure of dropped metal ceilings suspended by rods from steel trusses. But below the ceiling there was much deterioration. "In some areas only pieces of the original oak wainscoting remained," recalls Straw. "We had to move some of the pieces and reconstruct others." Plaster decorations and moldings were duplicated in a workshop set up in one of the building's rooms.

The School District of Philadelphia had a few rules for the

**Project:** *Philadelphia High School for the Creative and Performing Arts, Philadelphia, Pennsylvania*
**Owner:** *The School District of Philadephia*
**Architect:** *Kise Straw & Kolodner—James Bennett Straw, AIA, principal-in-charge; Nilo C. Regojo, project manager*
**Lighting designer:** *The Lighting Practice—Alfred R. Borden IV, principal; Julie Panassow, associate*
**Theater design and lighting consultant:** *Roger Morgan Studio—Roger Morgan, principal; Martin Vinik, associate*
**Mechanical/electrical engineers:** *Mark Ulrick Engineers—Ulrick Joseph*

*K. Schiffman is a freelance writer located in Philadelphia. A graduate of Temple University's School of Communications, she writes on many subjects, including architecture and lighting technology.*



The school library, originally one of the building's reading rooms, is lit with suspended bidirectional fluorescent fixtures.

lighting of the school. High on the list was that it be energy-efficient, easy to maintain, and accomplished with a minimum of lamp types. But these constraints did not keep Borden's design from enhancing the architecture of the building. "The whole project is lit in a deceptively simple way," he says. "We tried to keep fixtures as unintrusive as possible yet still give the building the grandeur it deserves." The objective was to show off all the reconstructive work in a way that seemed natural.

The school's facade was lit by metal-halide fixtures on poles installed near Broad Street. In order to keep light from spilling onto nearby homes, the luminaires have tight beams, which were carefully aimed. Wider beams were focused on the pediments of the front elevation. Surface-mounted metal-halide fixtures with asymmetric reflectors backlight the colonnade.

In the main hall, the ceiling was uplit with metal halide to "mimic the way the space would originally have been filled with daylight from clerestories and several skylights," says Borden. "We have simulated that feeling using electric light. In order to keep the indirect lighting from making the space look flat, we put halogen accent lighting in downlights along the perimeter walls. The halogen light, which is significantly warmer than the metal halide, helps draw one's eye up to the gallery level. Where the skylights and clerestories remain, we used additional fluorescent lighting." Halogen downlights drop warm pools of light on the main hall's grand staircase. In the school's library, which was a reading room in the original Ridgway Library, cable-suspended direct/indirect fluorescent fixtures hang centered below each ceiling coffer.

There are two music rooms accessible from the main hall stairs; one is at the top of the stair, and the other directly across the gallery. High-color rendering metal halide was used to give the music rooms a luminous feeling. "We wanted to create the light level that the students would need to read music and avoid shadows," Borden explains, "and at the same time not disturb all the acoustic treatments on the walls and in the coffered ceilings. We used warm, phosphor-coated metal-halide lamps in downlights with gold reflectors. It gave the rooms the incandescent feel we were looking for." Because metal halide must warm up before restriking, these lights are on timers to keep them from being accidentally turned off during the day.

**Ceiling vaults in the rathskellar (top left) are illuminated by bi-directional fluorescent pendants. The new art studios (left) have skylights supplemented by fluorescent and halogen track. The size of the theater (above) and its lighting system can be changed as needed to accommodate performance requirements and audience size.**

The space in the basement of the building that was occupied by the city recreation center is now the school cafeteria, or rathskellar. It too has its own reconstruction story. Originally, the brick archways supporting the ceiling were plastered. Once the contractors began to scrape and refinish them, the old plaster started to fail. The painting contractor refused to guarantee the work, because in that condition it would continue to fall off. "The brickwork we discovered when the plaster was being removed for these repairs was so lovely," says Straw, "that we decided to leave it uncovered. Al [Borden] had to go back in and redesign the lighting for the newly exposed dark brickwork. The result is a surprisingly nice set of archways and a beautifully lit room."

"The rathskellar could have been dingy," continues Borden, "so we did a more luminous treatment. Originally the school district wanted wall-mounted lighting fixtures—they wanted them to be just about bulletproof—but they settled for a few wall sconces to add interest to the indirect, out-of-the-way fluorescent uplights we chose to light the vaults. The space is arranged so the columns are darker and the ceiling is brighter—almost a daylight effect, where the ceiling is radiating the light down."

Another addition to the high school is a very user-friendly 350-seat theater. It was built as an extension to the rear of the original building, and its back wall, which had been an exterior stone wall of the building, was left exposed. Roger Morgan, of Roger Morgan Studio, designed the stage, the seating, and the lighting. Morgan was fascinated by the opportunity to work on a theater for young people. "It's a big challenge to design a space that is also a teaching tool," says Morgan. "It's important to give the students a space they can manage. The space needs to be both easy to use as far as lights and sets go and yet adaptable to different types of activity." Morgan built catwalks that span the entire theater—above the seating and the stage—to give students the flexibility to change the lights for both production and audience size. In addition, there are tracks hanging from the catwalks, giving students the ability to physically draw curtains and change the seating capacity. "It's important to make things intimate," adds Morgan.

With all of the utilitarian features needed in an arts school added to the costs of restoring the building, the budget was not that of an ordinary school project. "The school district kept asking how we could be spending more than three times what their rules of thumb suggested," remembers Morgan. "I would troop myself in front of them and remind them that this was not a typical high school."

The restored CAPA aspires to capture the spirit of architecture during the Greek Revival period. As an adaptive reuse project, it has regained its original opulence. And though it has an imposing visage, CAPA still manages to be user-friendly—important for an educational institution.

Borden, trained as a theatrical lighting designer by education, was endeavoring to paint the building with light, to give it a distinct feeling. "Onlookers should sense that the building is attempting to reach for a grander, more celestial state of achievement," says Borden. It is exactly what a high school for the creative and performing arts, filled with young minds and raw talent, should be. ■

**Sources**

**Downlights:** *Kurt Versen*

**Atrium lobby lights:** *Sterner*

**Accent lights:** *Lightolier*

**Exterior facade lighting:** *Arc Sales*

**Fluorescent pendants:** *Peerless Lighting, Litecontrol*

**Historic lantern reproductions:** *Spring City*

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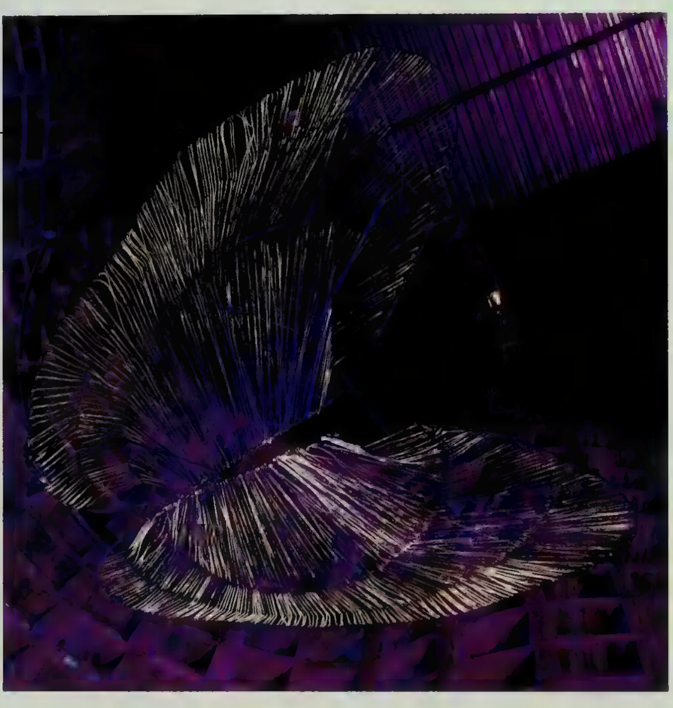
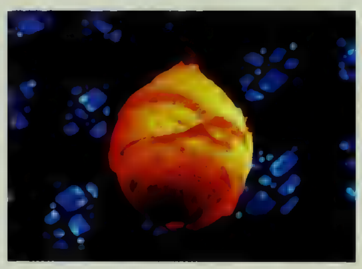
CIRCLE 76 ON INQUIRY CARD

# Three Interactive Lighting Installations Fill a Blue-edged Darkness

**By David Simon Morton**





**A butterfly and cocoon from *Satori* (above and right). A sensor in each cocoon detected a visitor's presence, illuminating the fiber optics of a butterfly above. Each wing contained 420 fibers.**

The Great Hall of the New York Hall of Science, designed by architect Wallace K. Harrison for the 1964–65 World's Fair, is supposed to feel like outer space. The 80-foot-high undulating wall that surrounds the hall is a grid of frosted cobalt-blue nes that, when backlit by the hardest daylight, glow with the soft ength of starlight. It is essentially a well-crafted void, a perfect space, rhaps, for meditation. But it needed "Lightforms '98," a spring exhibin of three kinetic lighting installations sponsored by Art and Science llaborations, Inc., to make it as exciting for kids as, say, the popular ience Playground just outside.

Of the three installations, *Lost Referential,* by Montreal artists uis-Philippe Demers and Bill Vorn, was the most fully integrated into hall's architecture, giving the space a brain through artificial intelence (AI). Thirty-two pyroelectric sensors spaced along the walls tected visitors' movements, forwarding the information to a computer dden in a storeroom. As a first response, one of eight cyberlights spun ound and spotlighted whoever tripped the sensor.

An AI program that the artists developed processed the data colted from the sensors, conceiving responsive patterns of light. Somenes the lights swarmed around an area where people were concentrated. if the program had changed its mind, the cyberlights then scattered d collected in empty areas of the hall. Sometimes the lights just moved random.

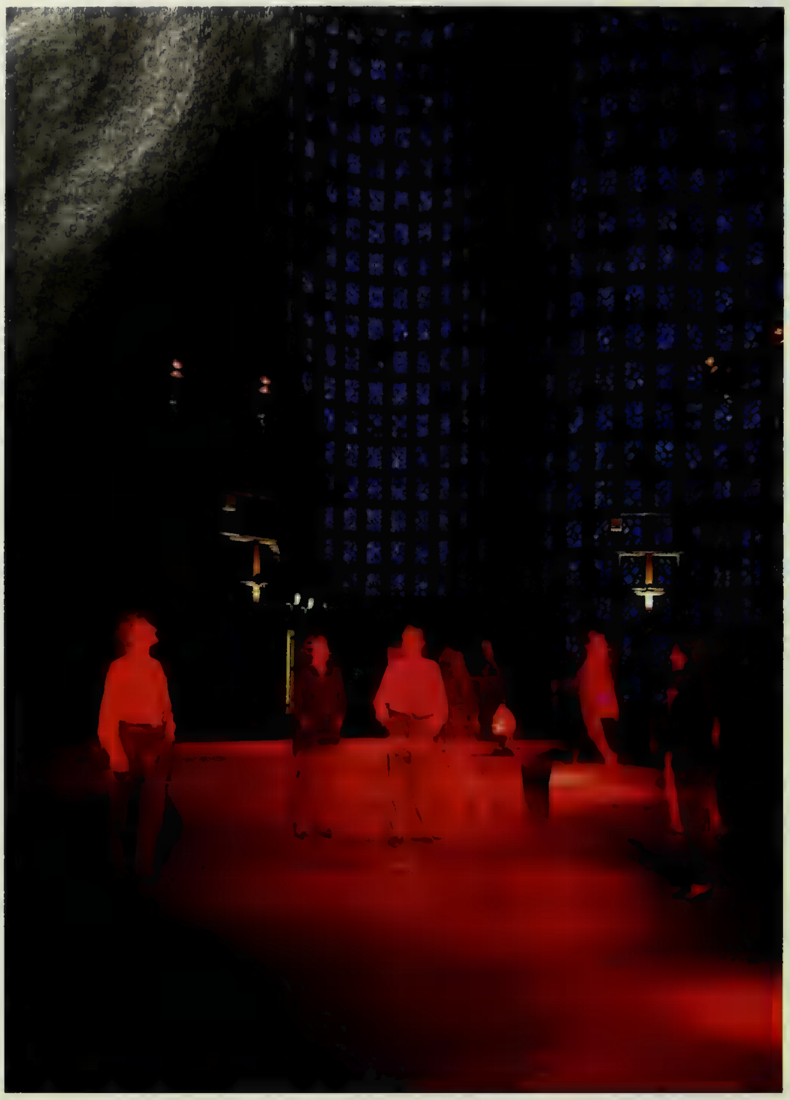
Demers and Vorn also gave the hall a heart, an amplified beat rresponding to the human pulse triggered when someone put their finr in an EKG monitor (subject and monitor were lit by a Source 4 lamp). xteen Fresnel lights, their amber glow contrasting with the cobalt blue lls, pulsed to the same beat. With eight different sound samples proammed by the artists playing in eight different speakers placed around e room, the installation was quite loud.

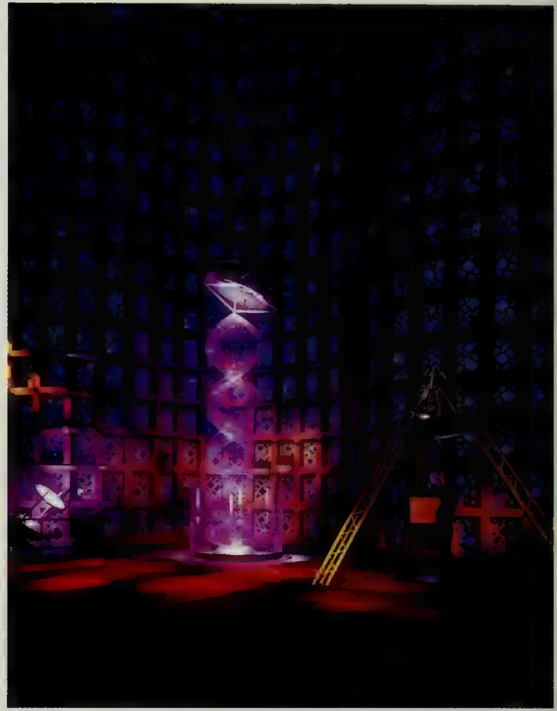
Equally dynamic, if less sprawling, was English artist Paul iedlander's *Dark Matter,* a vertically suspended, whirling nylon rope of anging colors and speed that filled one of the Great Hall's ten curved ys to a height of 25 feet. Friedlander, who has a degree in physics, spent uch of his career designing stage lighting for such rock acts as Pink oyd before he marshalled his interests for his current profession: buildg light sculptures that represent theoretical physical phenomena. *Dark atter* is not dark. The sculpture is a visualization in light of what some ientists have theorized are cosmic strands that, in invisible concentraons, make up 90 percent of the universe's mass. Friedlander was also spired by the spinning motion of a jump rope.

Below, a turntable housed in a plywood casing powered the pe's movement. Above, a flat Mylar "space mirror," secured by steel wire bles, was tilted at an angle of 15 degrees in relation to the rope. On the oor to one side was a 4000W HMI arc lamp fitted with a wheel of several different color filters that rotated at high speeds. To the other side stood a pyramidal control station, constructed of thin-walled aluminum tubing, where two downward-pointed sound beams (paired with PAR lamps) awaited visitor interaction.

Moving one's hand in the path of one sound beam altered the speed at which the rope spun. Movement below the other sound beam altered the speed at which the color wheel rotated. The faster the rope spun, the louder the whirring sound accompanying it. The faster the color wheel rotated, the more the vertical bands of color on the dynamic column of rope appeared to converge.

The effect was chromastrobic, a trembling spectrum achieved without the splitting of light. The arc lamp directed light through a 35-inch-diameter Fresnel lens to the mirror, which reflected a column of light downward onto the moving rope. Even though the color wheel in the arc lamp was rotating rapidly, different colors appeared on the rope at the same time because it, too, was in a whirl. *Dark Matter* emitted enough





**Guided by artificial intelligence, the cyberlights of *Lost Referential* (left) alternately chased and fled from visitors. At times the lights of *Lost Referential* converged on the dynamic spinning rope of *Dark Matter* (above). Visitors could manipulate the speed of the rope and how colors appeared on it.**

energy to activate the sensors of *Lost Referential,* causing that installation's cyberlights to occasionally converge on the moving rope.

Hanging at eye level toward the middle of the Great Hall were three glowing cocoons, designed by Dutch artists Dirk Rutten and Jeroen Kascha. At first their installation appeared simple: conventional 40W bulbs encased in translucent paper, with the sounds of crickets chirping overhead.

But there was more: unseen in the dark were heat sensors jutting out from the skin of the cocoons. When a person came within six feet of the installation and stayed for six seconds, a control box sent a signal up a 40-foot electrical wire into the darkness above. The light in the cocoon went off and, accompanied by the sound of a magic wand, a butterfly with a 15-foot wingspan appeared overhead.

Fiber optics were at work: a computer-controlled 150W or 200W illuminator at the center of the aluminum-frame butterflies lit up 420 fibers in each wing, the colors changing with each metamorphosis. After three seconds, the control box in the butterfly shut off the light, and the cycle was reset. Before the butterfly appeared again, the observer would have to step outside the six-foot radius.

This installation was called *Satori,* the Japanese Buddhist term for sudden enlightenment, but because of the six-second delay, it took the kids roaming the hall a while to figure out why the butterflies were appearing. Throughout the hall, it was as if light wasn't moving at the speed of light, but had been slowed somehow for the sake of metaphor, and for play. ■

**THE GREAT HALL WAS A WELL-CRAFTED VOID IN NEED OF SOME EXCITEMENT.**

**Sources**

**Cyberlights (*Lost Referential*):** *High End Systems*

**Lightboard (*Lost Referential* and *Dark Matter*):** *Leprecon*

**HMI 4000W arc lamp (*Dark Matter*):** *KOTO*

**Ultrasonic sensors (*Dark Matter*):** *Soundbeam*

**Side-emitting fibers (*Satori*):** *TPR Enterprises and Lighting Projects of Philips*

**Halogen lamps (*Satori*):** *TPR Enterprises (150W) and Lighting Projects of Philips (200W)*

**Fiber-optic illuminators (*Satori*):** *TPR Enterprises and Lighting Projects of Philips*

**Infrared sensors (*Satori*):** *Macro/Leviton*

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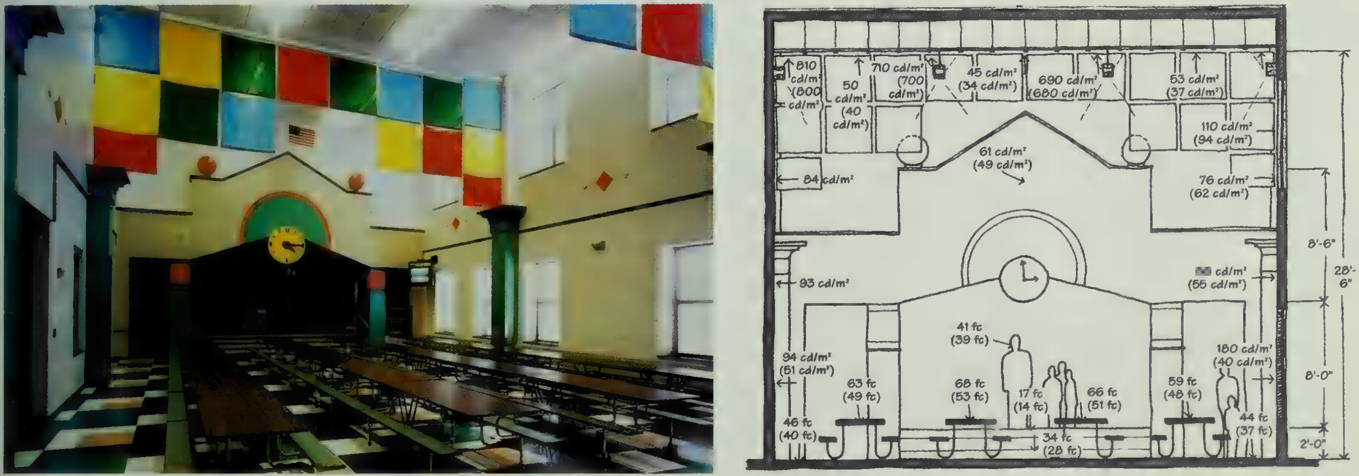
# Case Study: An Elementary School that Saves Energy and Is Visually Comfortable

**by Paula A. Rodgers**



**The cafeteria is lit with continuous rows of wall- and cable-mounted fluorescent up- and downlighting. The stage is lit with track lighting fitted with color filters and louvers.**

Elementary schools offer the architect and the lighting designer a variety of lighting challenges, from classrooms and cafeterias to gymnasiums. Lighting design in schools is far different now than it was in the 1950s and 1960s, when more light was equated with better sight. Lighting design for today's schools instead emphasizes visual comfort, energy conservation, and the intelligent integration of daylight into learning spaces.

Rensselaer Polytechnic Institute's Lighting Research Center investigated the effectiveness of the lighting schemes used in the recently opened 100,000-square-foot Mary McLeod Bethune Elementary School in northeast Rochester, New York, by surveying students and teachers about their response to the lighting and by looking at the school's energy use. The findings of the center's DELTA (Demonstrations and Evaluation of Lighting Technologies and Applications) team, presented here in a case study, offer lessons for both lighting designers and architects.

The colorful two-story facility accommodates up to 800 children in preschool through fifth grade. One of the goals of the design was to give the large school a more intimate scale, so that the children could relate to each other in smaller groups. To accomplish this architecturally, SWBR Architects, who designed the school building, used offset corridors in the large L-shaped building to subdivide it into "neighborhoods." Another goal of the design was to allow for technological advances in education: currently each classroom in the school is connected to a district-wide video learning program through computers and a television system.

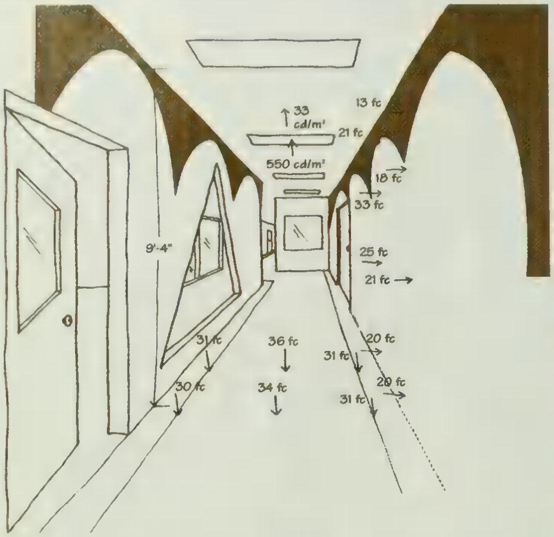
*Paula A. Rodgers was the project coordinator and team leader for the Lighting Research Center's DELTA study of the Mary McLeod Bethune Elementary School.*

## Lighting objectives

The objectives for the school's lighting, designed by architects Tom Ritzenthaler and David M. Kaye, of the Rochester City School District, and M/E Engineering, were simple: to use energy-efficient lighting products to reduce lighting energy use; to simplify maintenance by limiting the number of lamp types and by using lamps that the district already stocks; to provide low-glare ambient lighting to produce a visually comfortable environment for students and teachers; to increase energy savings by automatically switching off lighting when classrooms are not in use; and to integrate windows and skylights throughout the building to give students and teachers a connection to the outdoors.

**Project:** *Mary McLeod Bethune Elementary School, Rochester, New York*
**Owner:** *Rochester City School District*
**Architect:** *SWBR Architects*
**Lighting Design:** *Rochester City School District—Tom Ritzenthaler, associate architect/project manager; David M. Kaye, assistant architect, facilities; M/E Engineering*
**Site Sponsors:** *Rochester Gas and Electric Corp.; New York State Energy Research and Development Authority*
**Evaluation:** *Rensselaer Polytechnic Institute Lighting Research Center DELTA team—Naomi Miller, program director; Russell Leslie, Mark S. Rea, reviewers; Paula A. Rodgers, project coordinator; Naomi Miller, evaluation team leader; Judith Block, publication manager; Claudia Hunter, editor; Naomi Miller, Conan O'Rourke, Paula A. Rodgers, evaluation team; Peter Boyce, John Bullough, Neil Eklund, Andrew Johnson, Devki RajGuru, Sandra Vasconez, technical assistance*

Corridor walls use patterns to help students identify their "neighborhoods." One-by-four-foot fluorescent troffers light the way.



Energy efficiency was achieved by using T8 fluorescent lamps powered by electronic ballasts in classrooms, corridors, the library, and the cafeteria. These have a color-rendering index of 85 and a correlated-color temperature of 3500K (neutral). The gym received a combination of energy-efficient high-pressure sodium and metal-halide lamps. Ultrasonic occupancy sensors were used in classrooms to detect movement and to switch lights off when the rooms were not in use.

### Typical classrooms

The typical 1,000-square-foot classroom at Bethune Elementary School has a 12½-foot ceiling with continuous rows of pendant-mounted fluorescent uplights. Each fixture has two rows of slots on the bottom, which contain perforated white metal panels whose openings provide a small amount of surface brightness. Uplights are spaced nine feet apart and suspended with aircraft cable 18 inches from the ceiling to the top of the luminaire. To add visual interest to the classrooms, the soffits and soffit faces were painted in bright colors.

During the day, with the classrooms' horizontal blinds partially open, DELTA measured horizontal illuminances at student desks of 38–48 footcandles (fc) (410–520 lux [lx]). Nighttime desk illuminances were 30–49 fc (320–530 lx). These illuminances comply with the State Education Department of the University of the State of New York's guideline of a minimum of 30 fc maintained on classroom desks. The daytime and nighttime vertical illuminances in the center of the main chalkboard are about 27 fc (290 lx), very close to the state's guidelines of 30 fc on chalk- and display boards.

Students learn to use computers at a work area in the back of the classroom. Ceiling luminances in this part of the classroom range from 560 candelas per square meter (cd/m$^2$) directly above the luminaires to 110 cd/m$^2$ between luminaires. This 5:1 luminance ratio meets the Illuminating Engineering Society of North America's Recommended Practice for Office Lighting (ANSI/IESNA RP-1-1993) for spaces where video display terminals are used.

In each classroom a television is suspended in one corner and is operated by the teacher with a hand-held infrared remote control. The electronic ballasts in the uplights interfere with the remote control, so the teacher must turn off the lights in order to operate the television. This is a minor annoyance for the teachers, but the darkened room actually enhances the visibility of the television. All lighting is controlled by an ultrasonic occupancy sensor near the center of the main classroom area.

### Vaulted-ceiling classrooms

Some of the classrooms on the second floor of the school have vaulted ceilings with a 26-foot apex. Asymmetric fluorescent uplights are mounted around the perimeter of the room 13½ feet above the finished floor, and a 12-foot-long uplight with symmetrical distribution is suspended at the same height in the center of the vault. The soffits are painted in bright colors, which continue up the vertical surface at the base of the vaulted ceiling. Above the chalkboard, a continuous linear luminaire is recessed in the soffit for supplemental lighting on the board. The computer work area is lighted by compact fluorescent downlights recessed in the soffit.

During the day, with the horizontal blinds open and all lights on including the chalkboard light, desktop illuminances range from 26 to 39 fc (280–420 lx). At night the illuminances are similar, ranging from 26 to 36 fc (280–390 lx). The vertical illuminance in the center of the chalkboard is about 20 fc (220 lx) day and night.

The illuminances that DELTA recorded in the vaulted classrooms are slightly lower than in the classrooms without vaulted ceilings. This difference is probably due to the color of the wall above the uplights, which is as low as 10 percent reflective, absorbing light that would otherwise be reflected back into the space. DELTA compared the illuminances in these rooms to those in the vaulted-ceiling art room, where all the wall and ceiling surfaces were painted white: illuminances on the desks were 20 fc (210 lx) higher in the art room.

### Gymnasium, library, cafeteria, and corridor lighting

The gym can be divided into two small courts. The 31-foot-high barrel-vaulted ceiling runs lengthwise southeast to northwest. Sunlight falls on the southeast- and southwest-facing translucent fiberglass windows all

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**Typical classrooms (below left) use indirect fixtures that have slots on their undersides to allow a small amount of direct light into the room. Similar fixtures are used in vaulted classrooms (below right), but they are augmented by fixtures mounted on the side walls. The library (right) uses indirect fluorescent fixtures similar to those in the classrooms to produce 45 footcandles at the desktop surfaces.**

day, providing diffused daylighting. In addition, HID luminaires light the ceiling, which is made of metal decking painted white. These uplights, mounted on the bottom chord of the ceiling trusses, six to nine feet from the ceiling, contain one metal-halide lamp and one high-pressure sodium lamp in the same housing. Even though the two light sources have very different color appearances, the luminaires are far enough from the ceiling that the colors combine to produce a yellow-white light on the ceiling and the floor below. Illuminances at the floor range from 35 fc (380 lx) near the wall behind the basketball hoops to 68 fc (730 lx) in the center of the gym. Vertical illuminances at five feet above the floor average 39 fc (420 lx), far above the minimum of 20 fc required by New York State for gyms.

In the library, continuous rows of uplights are mounted on an eight- to ten-foot spacing, providing an average of 45 fc on tabletops in the reading area. This exceeds New York State's minimum requirement of 30 fc at desk height in libraries. In the stack area, vertical illuminances range from 22 fc (240 lx) at the highest shelf to 14 fc (150 lx) at the lowest. Titles on book spines are easy to read on all the shelves. At the circulation desk, CFL downlights recessed in a dropped soffit boost light levels to 64 fc (690 lx).

The lunchroom is a two-story space that uses continuous rows of fluorescent up- and downlighting, pendant- and wall-mounted about one foot from the ceiling. The short suspension length prevents the uplight from spreading evenly on the ceiling, so bright stripes of light are visible above each luminaire. The two-lamp downlight section provides an average of 50 fc (540 lx). Horizontal blinds, usually closed, shade windows on the south wall. During the day, with all the lights on, illuminances at the lunch tables average 64 fc (690 lx). Brightly colored banners echoing the accent colors in the classrooms are suspended from the ceiling in a staggered pattern, catching light from the linear luminaires as well as from the high windows.

There is a large and very colorful proscenium stage at the east end of the cafeteria, where students rehearse and perform school plays and concerts. The stage is deep, with several rows of black curtains and track lighting controlled by a small theatrical dimming system. The track lights are fitted with louvers and colored filter accessories, which the students can use to produce a variety of stage-lighting effects. Work lighting is provided by fluorescent wraparound-lensed luminaires surface-mounted to the ceiling.

**ELEMENTARY SCHOOLS OFFER LIGHTING DESIGNERS A VARIETY OF CHALLENGES.**

Corridors have different multicolored patterns in the walls and floor tiles to help students identify their school "neighborhoods." Recessed one-by-four-foot lensed fluorescent luminaires are spaced 10 feet apart, providing very uniform floor illuminances averaging 32 fc. They produce a slight scallop pattern on the walls, where student projects are displayed,

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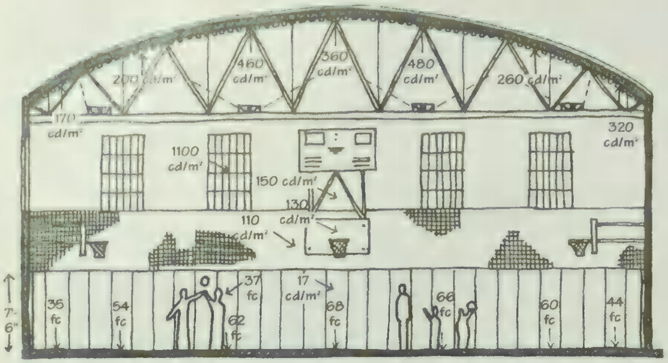

The gymnasium is lit by uplights mounted to the bottom joists of the ceiling structure. Each fixture has a metal-halide and a high-pressure sodium lamp inside that produce a yellow-white light.

but the maximum to minimum uniformity ratio is only 2.5:1. This even lighting makes the corridors seem bright and open, so students and staff can easily see where they are going.

## Evaluating the lighting

The DELTA team surveyed users at the school to get their impressions of the lighting. One teacher who taught in a vaulted-ceiling classroom felt that her room was not bright enough; she said her students sometimes had to come closer to the board to see what she was writing. DELTA compared photometric measurements in this room, whose upper wall surfaces were painted green, with the same type of room where all the surfaces were painted white. DELTA discovered that the low-reflectance accent paint color lowered the illuminances at desk height by about 30 percent. DELTA recommended that the school district paint all the surfaces above the uplights white to increase the amount of reflected light in the space.

Children also provided valuable feedback about the lighting. DELTA surveyed three classes of fifth-grade students, asking them to rate the quality of lighting in each of the evaluated areas and then compare it to the lighting in similar areas of the school they had attended the year before. Most of the students thought the lighting in the gym, the classrooms, and the corridors was good and that it was better in this school than in their previous school. Almost half of the students rated the cafeteria lighting as fair, but they still found it better in this school than in their previous school. A high percentage of students did not rate the lighting in the library, and although most of those who did respond rated the library lighting as good, they said the lighting in last year's school library was better. This apparent contradiction may be due to the fact that students had spent little time in the new school's library.

## Lessons learned

Indirect lighting can provide a visually comfortable classroom environment while using a modest amount of energy. In the case of Bethune Elementary School, the combination of energy-efficient lamps, ballasts, and luminaires; automatic controls; high ceilings; and adequate suspension lengths produced a classroom lighting environment that is pleasing in appearance and visually comfortable for teachers and students, at a lower lighting power density than energy codes require.

When relying on reflected light to illuminate a space like the vaulted-ceiling classrooms, the Bethune experience suggests that designers optimize surface reflectance by specifying light colors. The best solution is to use a color with a reflectance that is near the 75 percent reflectance of most commercial ceiling systems.

Mixing metal halide and high-pressure sodium in uplighting can be attractive. The six- to nine-foot distance between the uplights and the ceiling of the gym allows both colors of light to combine enough to produce a homogenous yellow-white light that reflects off the ceiling and down to the floor.

Some operational concerns were revealed in the course of DELTA's evaluation. Immediately after the school opened, a few teachers reported lights turning off in their classrooms when the rooms were still occupied. Once the sensitivity of the ultrasonic occupancy sensors was adjusted, however, reports of "false offs" in classrooms were reduced dramatically.

The DELTA team found that despite these minor problems, occupancy sensors do help save energy. The team used input watts from manufacturers' literature to calculate the lighting power density (LPD) for the school. The connected LPD for the entire building came to 1.06 W/ft≤. The in-use LPD during core school hours (8:00 a.m. to 3:00 p.m. weekdays) decreases to 0.88 W/ft≤. Much of the difference reflects DELTA's observation that many spaces, particularly the classrooms, used occupancy sensors that switched lights off during unoccupied periods of each school day. In addition, many spaces adjacent to the classrooms (storage areas, closets, lounges, copy rooms, and restrooms) were lighted only for brief periods during the day.

DELTA's evaluation of Bethune Elementary School suggests that creating lighting for educational facilities with a high degree of visual comfort as well as a large measure of energy conservation is an entirely feasible goal. ■

**Sources**

**Wall and suspended indirect fluorescent fixtures:** *Peerless Lighting, National*

**Recessed compact fluorescent downlights:** *Capri Lighting*

**Incandescent track:** *Capri Lighting*

**HID uplights:** *Lam Lighting*

**Fluorescent troffers:** *Daybrite*

**Electronic ballasts:** *Advance Transformer, Valmont, Goldstar*

**Occupancy sensors:** *Universal Energy Control*

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*Barbara Kristiansen, Lighting Designer*
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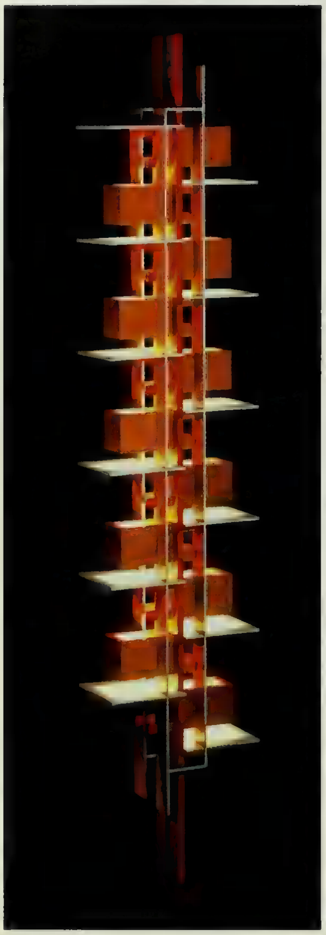
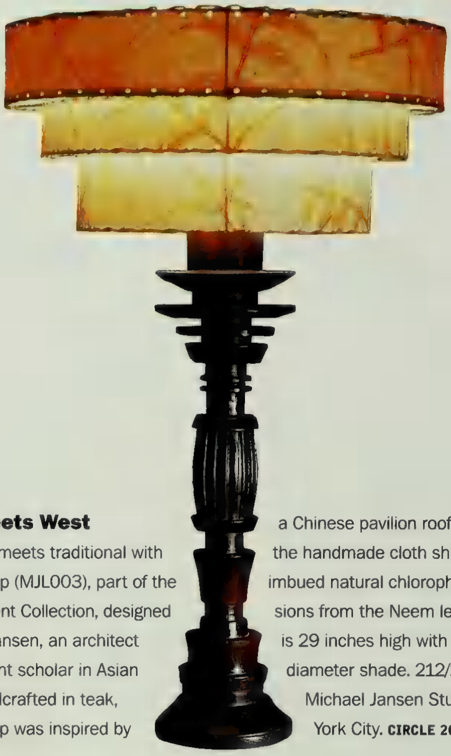
## LIGHTING BRIEFS

### ▼ Sculptural form

Based on Frank Lloyd Wright's Taliesin pendant, Yamagiwa's cherry wood reproduction has 11 incandescent 25W lamps concealed within a series of open-ended boxes. The pendant measures about 7 feet 4 inches high, 16½ inches wide, and 8 inches deep and weighs 35 pounds. 818/879-8611. Yamagiwa, Westlake Village, Calif. **CIRCLE 200**



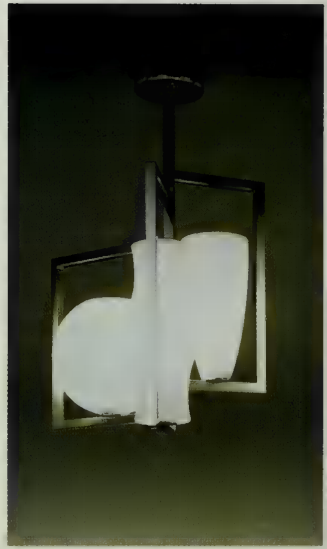


### ► East meets West

And modern meets traditional with the Diya Lamp (MJL003), part of the Asian Fragment Collection, designed by Michael Jansen, an architect and a Fulbright scholar in Asian studies. Handcrafted in teak, the table lamp was inspired by a Chinese pavilion roof. The details in the handmade cloth shade include imbued natural chlorophyll impressions from the Neem leaf. The lamp is 29 inches high with an 18-inch-diameter shade. 212/254-1645. Michael Jansen Studios, New York City. **CIRCLE 201**

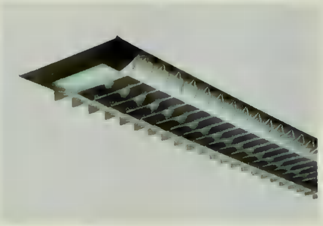
### ▼ 3D suspension

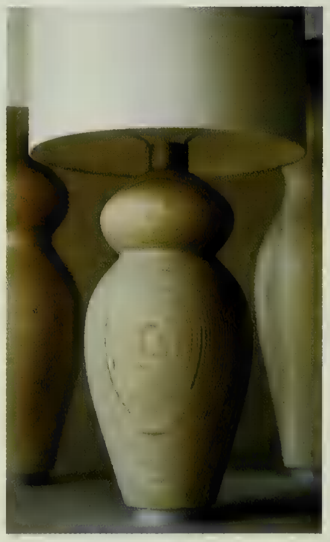
Designed by Andrea Anastasio, Artemide's Galatea Suspension 3 consists of a polished, chromium-plated metal structure and satinized opaline blown-glass diffusers. Part of the Galatea series, which includes a floor lamp and wall sconces, Suspension 3 measures 29 by 18 inches. 516/694-9292. Artemide, Farmingdale, N.Y. **CIRCLE 202**



### ▼ Elegant housing for T5

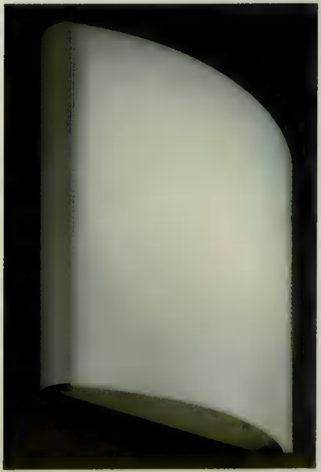
Zumtobel's Liberto can be connected in unbroken runs or capped with stylish end pieces. It has 3½-inch-deep housing and is available in 6- or 9-inch apertures with a low-energy T5 fluorescent source. 800/932-0633. Zumtobel, Highland, N.Y. **CIRCLE 203**

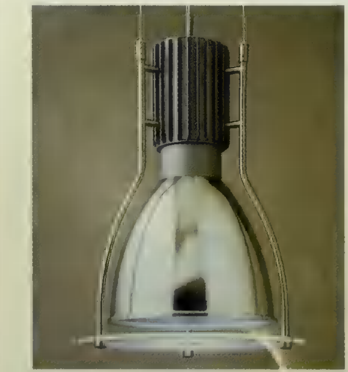




### ▼ Simple sconce

Neidhardt's 801 S wall sconce is made of extruded metal and textured white glass. This fixture can be outfitted with either two 13W compact fluorescent lamps and integral ballast or two 60W minican incandescent lamps. Optional plastic and metal shades are also available. The fixture measures 8½ by 10 inches. 800/978-8828. Neidhardt, San Francisco. **CIRCLE 204**



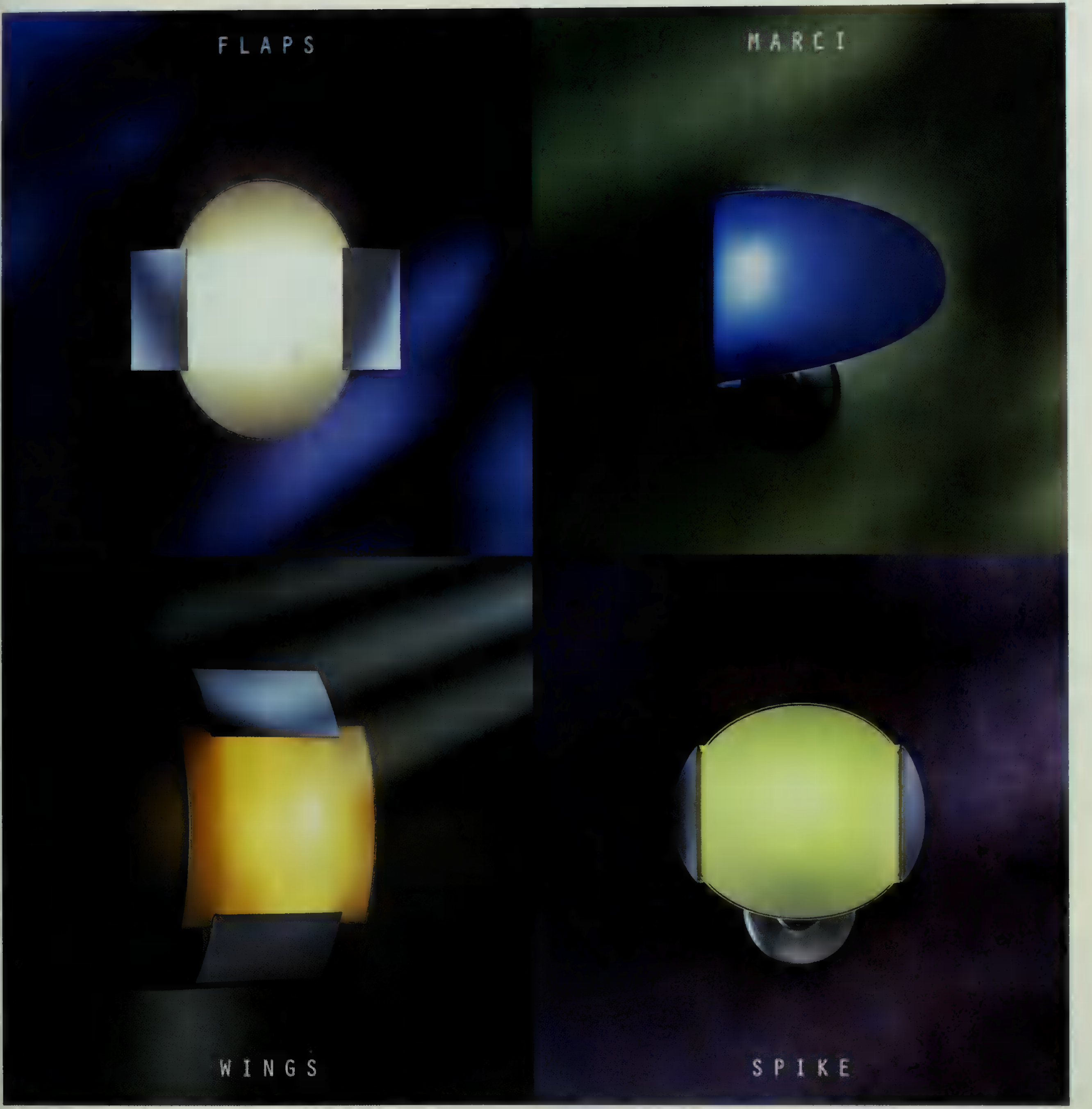


### ◄ High-powered pendant

Designed for high-ceiling applications, Lightolier's Pendalytes can be used with compact fluorescent, metal-halide, or incandescent light sources. The Pendalyte provides either direct/indirect (80/20 percent) light distribution with an acrylic refractor or total direct distribution with an aluminum refractor. The fixture is available with a 9-, 12-, or 16-inch diameter and with a dimming ballast. 800/215-1068. Lightolier, Fall River, Mass. **CIRCLE 205**

### ▲ Curvy carvings

Emily McLennan's Nina lamp is hand-turned from layers of Baltic birch plywood; it is also available in solid maple and solid alder. Height options range from 26½ to 29 inches. Shades can be either translucent white or opaque black, in paper or corrugated cloth. Available with black or metallic anodized aluminum fittings. 612/339-7746. Emily McLennan, Minneapolis. **CIRCLE 206**



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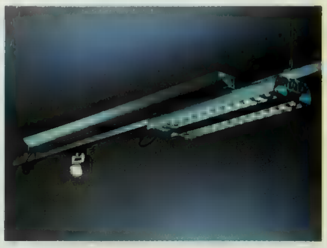
**CIRCLE 55 ON INQUIRY CARD**

## LIGHTINGBRIEFS

### ► Three-circuit fixture

LAM's Mobilé combines T8 and T5 fluorescent uplighting and diffused downlighting with halogen accents. It can be ceiling- or span-mounted or suspended. 714/549-9765. LAM Lighting Systems, Santa Ana, Calif. **CIRCLE 207**

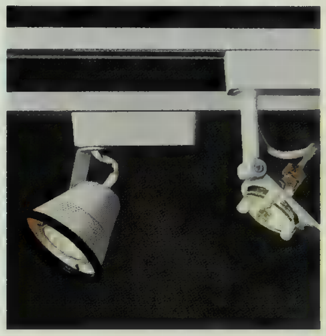


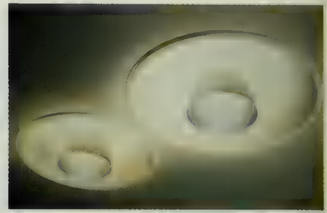
### ◄ Off the wall

The Glassglass series, by designer Paolo Rizzatto, is a collection of blown-glass diffusers in a variety of sizes, shapes, and colors. The ceiling-mounted fixture, shown here (it can also be attached to the wall), has a 250W double envelope halogen. A diecast metal stirrup-type handle is secured to the circular opening of the various diffusers. The stirrup is secured to a metal socket/cable support. 212/989-6265. Luceplan, New York City. **CIRCLE 210**

### ▼ Track heads

The Lazer series from Halo Lighting, a brand of Cooper Lighting, is a group of 41 lighting track heads designed for residential or commercial use. Available in line- and low-voltage, lampholder styles range from roundbacks, flatbacks, and step cylinders to high-tech gimbal rings and low-voltage luminaires. 708/956-8400. Cooper Lighting, Elk Grove Village, Ill. **CIRCLE 208**



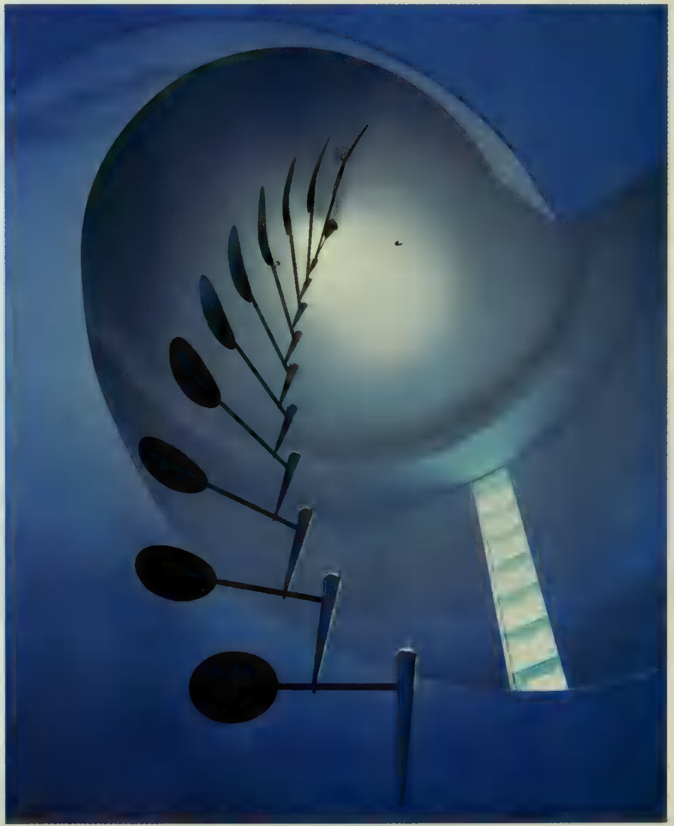


### ▲ Dish-shaped and diffused

Ardee's Indigo Circle lighting fixtures feature two energy-efficient round, semi-recessed, compact ceiling luminaires constructed from natural-finish galvanized steel and spun steel. The trim is an acrylic opal diffuser with a sandblasted plate-glass disk. 704/482-2811. Ardee Lighting, Shelby, N.C. **CIRCLE 209**

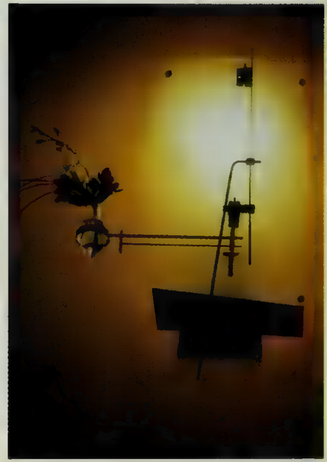
### ▼ Long-necked lamp

The asymmetrical Magna adjustable floor lamp, produced by Metalarte in Barcelona for Hinson Lighting and recently exhibited at the Milan furniture fair, is shown here in a black metallic finish with a translucent 22½-inch elongated oval shade. The height of the lamp ranges from 57 to 64 inches, with an extension that includes a 49-inch shade. The lamp requires a 250W bulb. 718/482-1100. Hinson and Company, Long Island City, N.Y. **CIRCLE 211**



### ▲ Calder-esque

The Spiral-Eye by Rae Douglass, shown here in a Maui residence, measures 10 feet high and 4 feet wide. The sculptural chandelier has an antique copper finish on the arms and fins, and polished aluminum on the lights. 800/206-1327. Rae Douglass, Tucson. **CIRCLE 212**



### ▲ From the deep

Named for the steel piece that pierces through the Lexan screen, the Shark light, designed and fabricated by architect David Celento and Adam Farmerie, combines fixed and moving parts. 412/242-9500. Celento Design, Pittsburgh. **CIRCLE 213**

### ▼ Pedestrian-scale

Reminiscent of a turn-of-the-century gas lantern, this pole-mounted outdoor area light, designed by Prescolite Moldcast and called Pedestrian ContraCline, is acorn-shaped and provides low-glare illumination from 10- to 16-foot mounting heights. 510/562-3500. Prescolite Moldcast, San Leandro, Calif. **CIRCLE 214**

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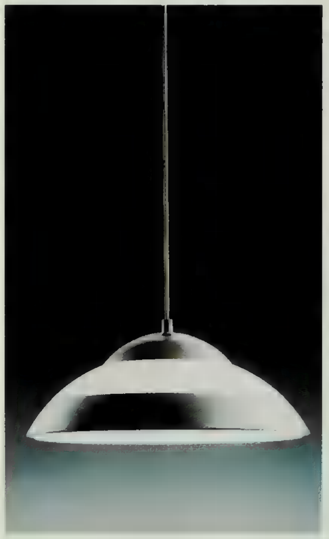
## LIGHTINGBRIEFS

**▲ Track construction**

The Capri ESP track adapter from Thomas Lighting works with the Capri track lighting system and with several other brands, including Halo, Con-Tech, Edison, and Juno. The application is UL-listed when used with these track systems. When the adapter is inserted, sensors determine the inside configuration of the track rail, adapt the contacts to it, and then lock it into position. 213/726-1800. Thomas Lighting, Los Angeles. **CIRCLE 215**

**▼ The highs and lows**

The MO3, a high-output, low-wattage metallic gray aluminum pendant, was created in collaboration with Danish designer Mads Odgaard. It relies on 3/18W quad compact fluorescent lamps and has an electronic ballast. 954/349-2525. Poulsen Lighting, Fort Lauderdale. **CIRCLE 216**



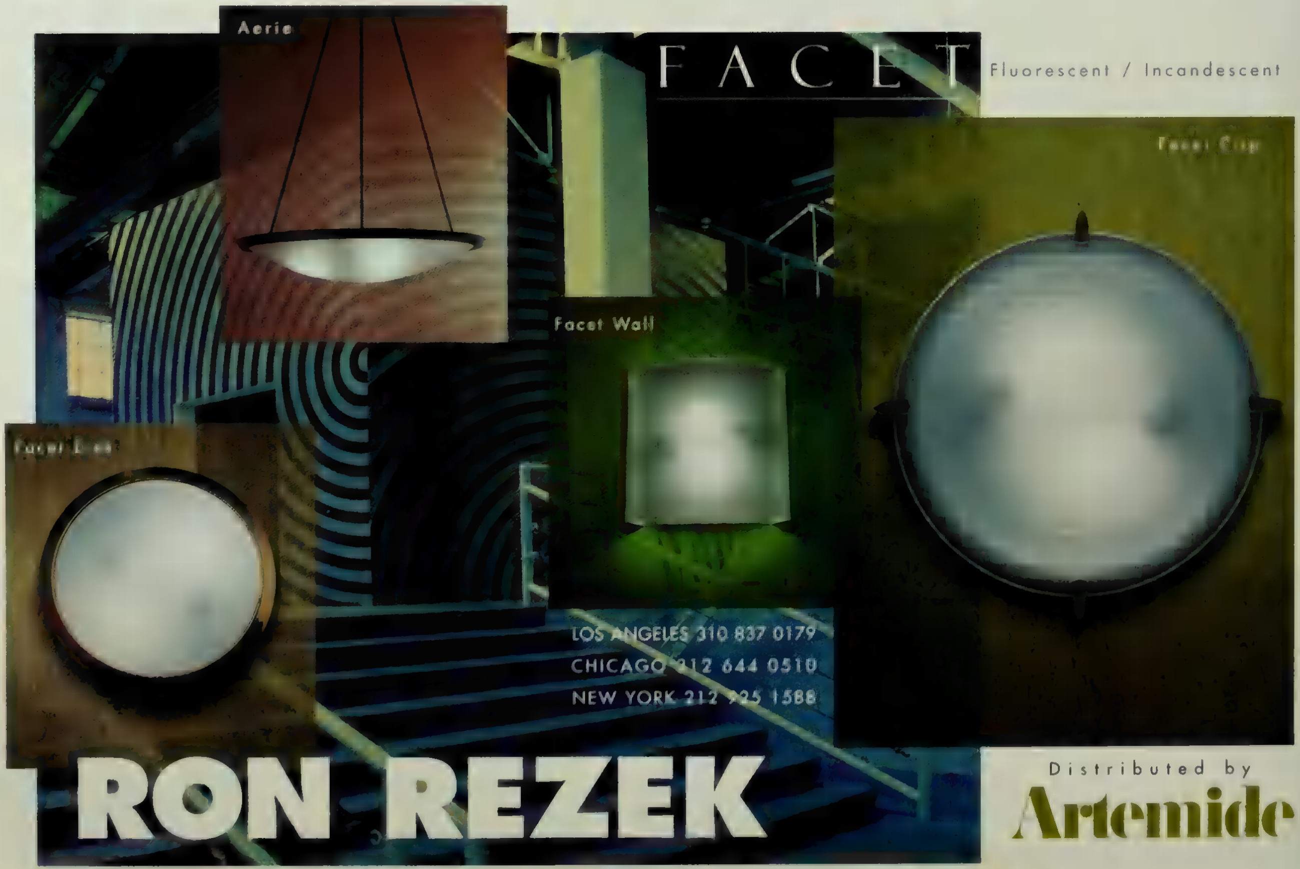
**▲ Concealed luminaires**

Kim's Lightvault collection includes five heavy-duty concealed luminaires for outdoor use. The one shown here is strong enough to withstand a car's weight—it has a reinforced composite housing and is trimmed in heavy-cast bronze. Other optical configurations include narrow flood, spot, HID PAR lamps, wallwashers, and an adjustable eyeball-style trim. 25/7-year limited warranty. 626/968-5666. Kim Lighting, City of Industry, Calif. **CIRCLE 217**

**▼ A surge of energy**

Designed to work with Unison's Optiflex fiber-optic cable in diameters of 3.2 mm, 5.1 mm, and 7.1 mm, the company's new indoor illuminator offers high light output and low energy consumption. It has a 68W metal-halide lamp, which provides a color temperature of 3500K and a color rendering index of 75. The optical train is sealed in the illuminator to prevent light loss due to dust or dirt. The illuminator has an average lamp life of 5,000 hours. 888/UNISON9. Unison, Solon, Ohio. **CIRCLE 218**

*For more information, circle item numbers on Reader Service Card*



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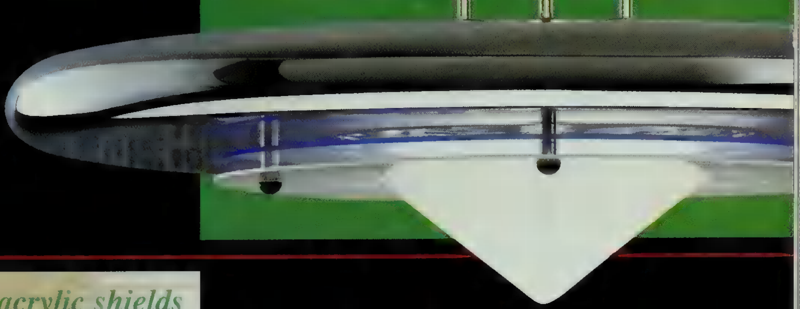

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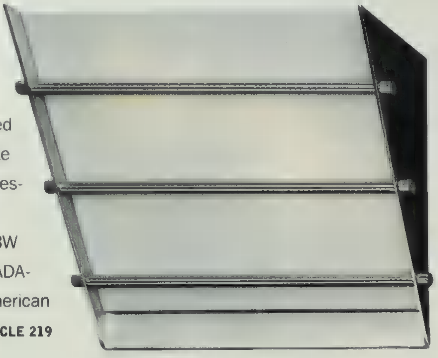
## LIGHTINGBRIEFS



### ► The American Dream

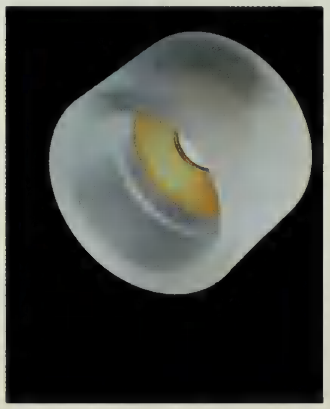
The Eugene sconce, from the American Glass Light Company, measures 10 inches wide, with an overall height of 8 inches. Constructed from satin aluminum and white sandblasted glass, the incandescent standard lamp requires two 60W candelabras; one 13W quad fluorescent is optional. ADA-compliant. 212/371-4800. American Glass Light, New York City. **CIRCLE 219**

### ◄ Suspended fluorescent

Made with a perforated or solid housing of heavy 20-gauge steel, Columbia Lighting's Indecon ceiling-suspended ambient indirect luminaire is available in one-, two-, and three-lamp units. The fluorescent tube on the one-lamp model and the middle tube on the three-lamp unit are angled diagonally to maintain consistent fixture lengths. 509/924-7000. Columbia Lighting, Spokane, Wash. **CIRCLE 221**

### ► Transformer integration

The traditional transformer required for low-voltage lamps has been integrated into Philips' ExhibitPAR halogen lamp for museum and gallery lighting applications. With an average life of 5,000 hours, the lamp is available in a 20W PAR 20 (2900K) and 35W PAR 38 (3000K) design. The ExhibitPAR's color rendering index is 100. 800/555-0050. Philips Lighting Company, Somerset, N.J. **CIRCLE 220**



### ◄ Cup and saucer motif

Fiberstars' FE-4133-XX accent light is a shallow, cylindrical glass fixture that measures 1¼ inches deep and 1¾ inches in diameter. Designed to look like a demitasse cup, the FE-4133-XX is made of lightweight, corrosion-resistant aluminum with polished gold center rings that mount into the base of each unit. 800/FBR-STRS. Fiberstars, Fremont, Calif. **CIRCLE 222**

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# NEW PRODUCTS

## TRADE SHOW ROUNDUP: INSIDE THE INDUSTRY'S BOOTHS

**The overriding message on the trade show circuit this year has been: "If your business isn't doing well, you shouldn't be in business." A booming economy—with a nod back to the '80s, when manufacturers hosted big parties—made the scene not only informative but fun. There were plenty of new products as well as heavy foot traffic that led to actual sales, making manufacturers happy. This page presents an overview of the trade shows from the first half of the year. The trends spotted most often were mosaic tiles and paneled office systems. —*Elana H. Frankel, Products Editor***

The first major show of the year was for the National Association of Home Builders (NAHB). Engineered wood products were everywhere, and companies finally took a clear position on the new product standard, PRI-400 (RECORD, March 1998). At Owens Corning, Mira Vista—a wood shake alternative made of slate and clay, reinforced with fiberglass and bonded with resin—was introduced for the West Coast.

At Orlando's Coverings show and at Cevissama, Spain's ceramic and tile show in Valencia, mosaic tiles were all the rage. At Coverings, the Italians showed combinations of cobalt blue and terra-cotta tiles and brightly colored four-by-fours. The Spanish featured more whimsical, fanciful tiles like the collections from Diago, celebrating the company's 90th anniversary, and from Agatha Ruiz de la Prada for Parmesa.

In April the Windy City hosted the Kitchen and Bath Show, where Kohler's collection of new hand-painted china bowls and Dornbacht's porcelain plumbing fixtures were among the most elegant introductions. American Standard and Corian led the way in new shower and tub installations.

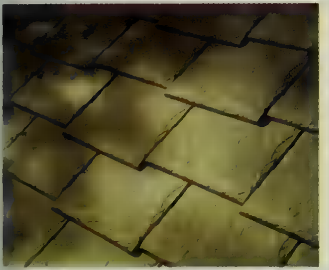
The big news in May: the AIA eliminated entrance fees to its annual convention and exhibition, held this year in San Francisco, and there seemed to be an overall positive feeling about the association's new attitude. Exhibitors from more than 450 companies and architects from more than 50 nations attended.

Also held in May, Lightfair brought manufacturers and attendees to gambling capital Las Vegas. Hundreds of new products were on display, a sampling of which can be found on pages 166–72.

At Neocon in June, Steelcase, Trendway, Herman Miller, Office Specialty, and Panel Concepts showed systems furniture, and Ann Sacks unveiled a new tile installation at the Field Museum store.

At the Construction Specifications Institute show (CSI), Zero announced that its Intumet fire and smoke seal has achieved a 90-minute positive-pressure fire rating for a standard negative-pressure–listed wood door and frame assembly. Also seen at CSI: formaldehyde-free products, including Johns Manville's commercial insulation (see page 178), and SierraPine's line of medium-density fiberboards.

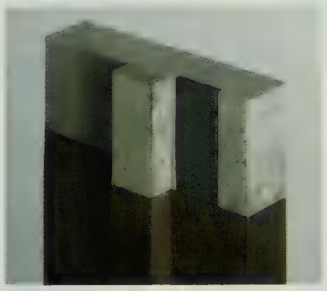
At all of the shows, green, blue, and almond were the forecasted colors. And, according to the Color Marketing Group, these colors are here to stay.



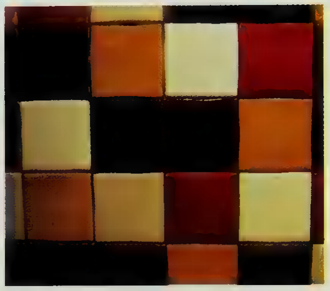
**Owens Corning's latest roofing innovation debuted at NAHB.**

**Ann Sacks Tile and Stone unveiled a classic floor tile motif at Neocon.**

**Bruck (below) and Ledalite (right) introduced new lighting fixtures at Lightfair in Las Vegas.**



**At the CSI show, Zero showed its Intumet fire and smoke seal.**



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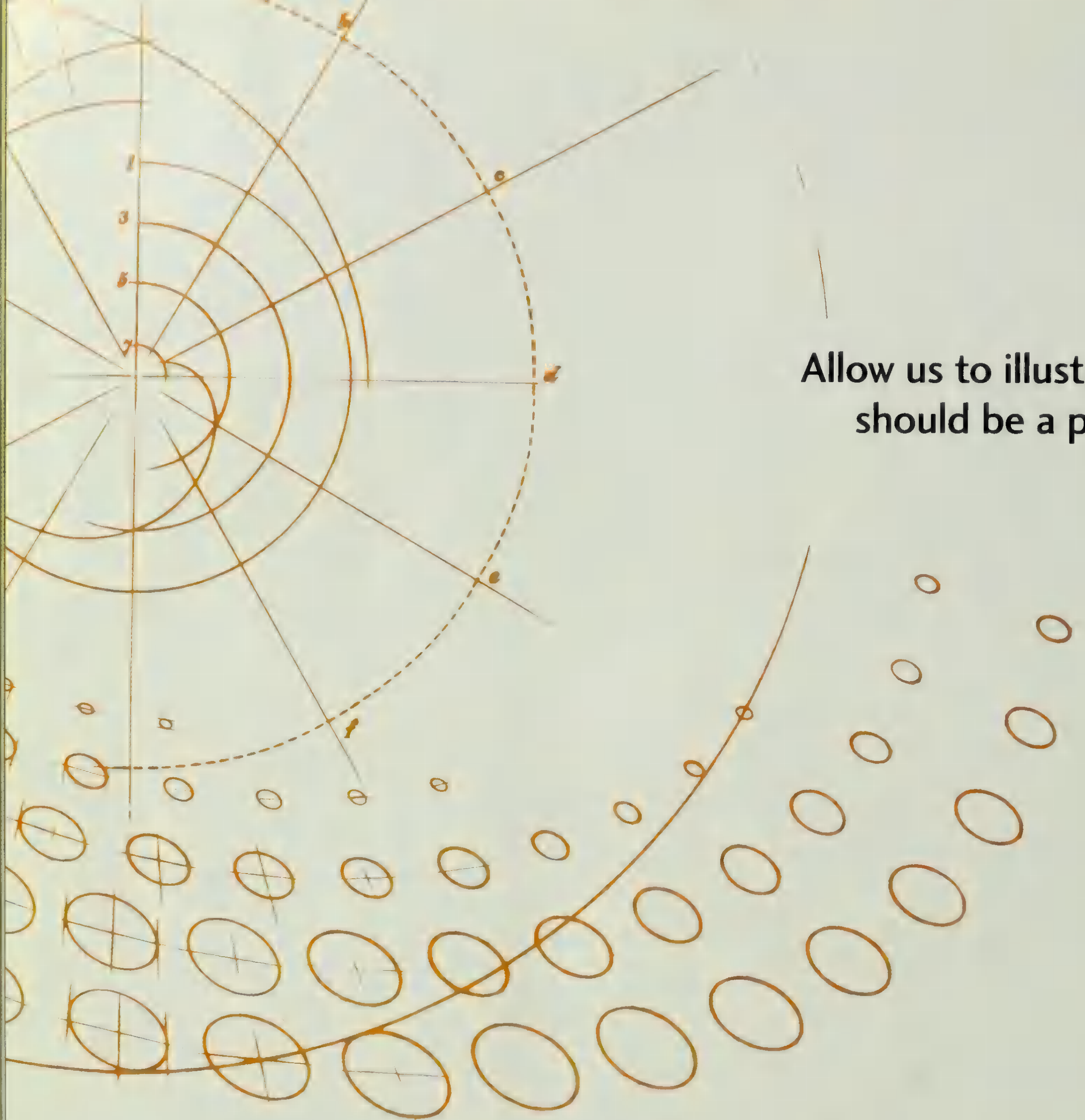
916/772-3422. CIRCLE 228
Tile of Spain, Miami
305/446-4387. CIRCLE 229
Zero, Bronx, N.Y.
800/635-5335. CIRCLE 230

**1999 TRADE SHOWS**

NAHB, Dallas, January 15–18, 800/368-5242
World of Concrete, Las Vegas, January 19–22, 800/837-0870
NRCA, Phoenix, February 7–10, 847/299-9070
Coverings, Orlando, March 23–26, 561/747-9400
Kitchen and Bath Show, Orlando, April 16–18, 800/527-0207
AIA Convention, Dallas, May 6–9, 617/859-4475
Lightfair, San Francisco, May 11–13, 404/220-2221
A/E/C Systems, Los Angeles, May 24–27, 800/451-1196
Neocon, Chicago, June 7–9, 312/527-4141
CSI, Los Angeles, June 24–27, 312/527-4141



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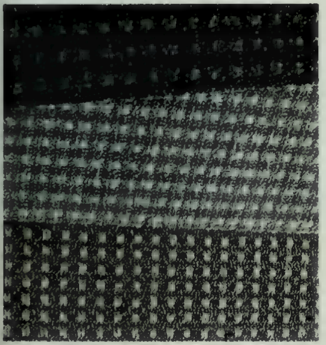
## PRODUCTBRIEFS

### ▲ Furniture solutions

Trendway introduced a new set of office products at Neocon this year called Contrada (Italian for community). The freestanding power arch, one of many design elements, is the backbone of the collection. It distributes power and data while also managing all of an office's cabling. 616/399-3900. Trendway, Holland, Mich. **CIRCLE 231**



### ◄ Carpet connection

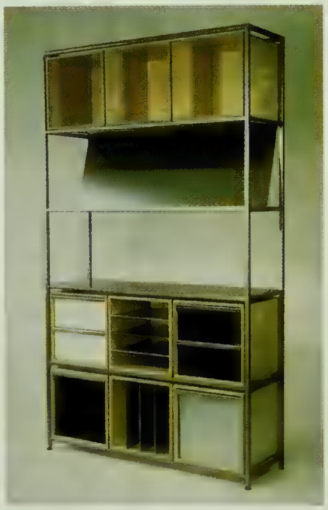
With the introduction of four new designs to the Fundamental Logic carpet collection, Lees, a division of Burlington Industries, has expanded its line of broadlooms. Graphique, shown here in three colors, has a subtle geometric pattern. Also available are Ombré, with an antiqued leaf pattern; Patina, with a linear motif; and Texturale, a cut pile. 910/379-2000. Lees, Greensboro, N.C. **CIRCLE 234**

### ◄ A rosa is a rosa

Landscape Forms has designed a weatherproof polyethylene planter, available in dove, ivy, grotto, millstone, patina, or cobblestone. Called Rosa, the planter comes in four sizes: 24 by 15 inches, 30 by 18 inches, 36 by 23 inches, and 42 by 13 inches. The planter can be specified with or without drain holes. 800/521-2546. Landscape Forms, Kalamazoo, Mich. **CIRCLE 233**

### ▼ Vive la France!

A new line of in-swing French doors from Marvin Windows and Doors has been tested and certified by the National Wood Window and Door Association to meet performance ratings of air filtration, water penetration, and structural integrity. 888/537-8269. Marvin, Warroad, Minn. **CIRCLE 232**

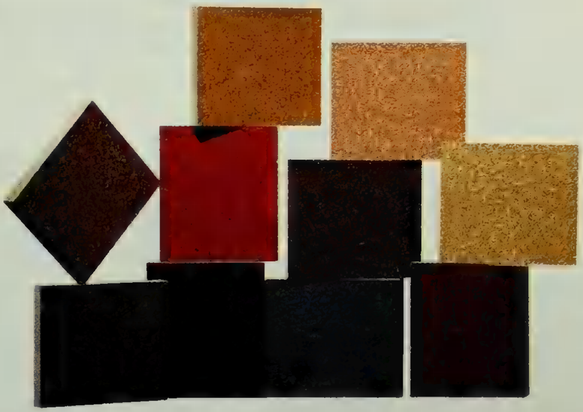


### ▲ Component storage

Daven Joy and Travers Ebling, partners in Park Furniture, one of the four West Coast design firms that form Unified Studios for Design and Architecture (USDA), have created a modular storage unit made of birch ply, aluminum, and stainless steel. 800/681-8732. USDA, San Francisco. **CIRCLE 235**

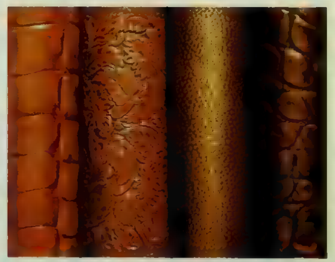
### ▲ Lazy working

Philippe Starck's L.W.S. (Lazy Working Sofa) collection for Cassina includes a sofa, ottoman, and armchair, shown here with a side table and lamp. Also available is the Miss C.O.C.O, a pressed-aluminum and plastic folding chair, and the M.T., short for Minimum Table. 516/423-4560. Cassina, Huntington, N.Y. **CIRCLE 236**



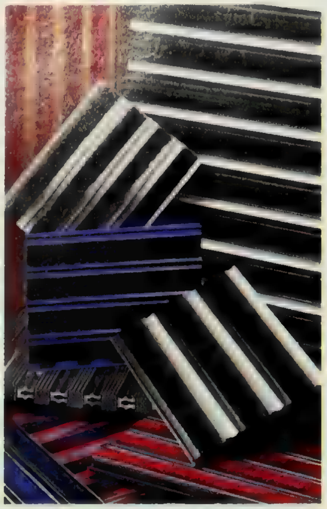
### ▲ Panel products

A new line of interior panel products, EcoColors, from Architectural Forest Enterprises, is made from straw waste. The fiber is pressed into particle board with a nonformaldehyde glue and then finished with nontoxic dyes, sealers, and top coats. Ten colors are available. 800-4-VENEER. Architectural Forest Enterprises, San Francisco. **CIRCLE 237**



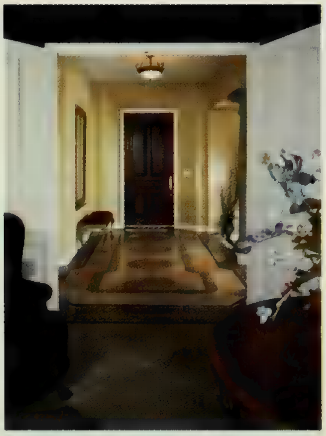
### ▲ Red leather, yellow leather

The Old Leather collection—for use in floor tiles or upholstery—from Teddy and Arthur Edelman, shown here in rich red browns and mellow gold tones, has a hand-antiqued, aniline-dyed finish. 203/426-3611. Edelman Leather, Hawleyville, Conn. **CIRCLE 238**



### ▲ Make an entrance

Now available in the United States through Bonar Floors, Nuway Entrance Systems—TuftiGuard Plain, Classic, and Design—consist of aluminum, brass, or high-impact PVC scraper profiles that alternate with nylon wiper strips to clean and dry footwear and wheeled traffic. The systems have antislip surfaces. 800/852-8292. Bonar Floors, Elk Grove Village, Ill. **CIRCLE 239**



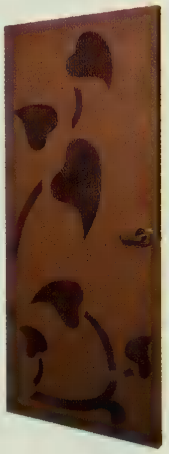
### ▲ Innovative interiors

Scofield's Overlay colored concrete was developed for use as an interior floor covering. Available in ash white, light gray, beige cream, tile red, and natural gray, Overlay can be stained to look like terrazzo, marble, ceramic tile, or granite. The material cures quickly to create a strong, flat, hard, and abrasion-resistant surface. The floor shown here features a tile-like design. 800/800-9900. L.M. Scofield, Los Angeles. **CIRCLE 244**

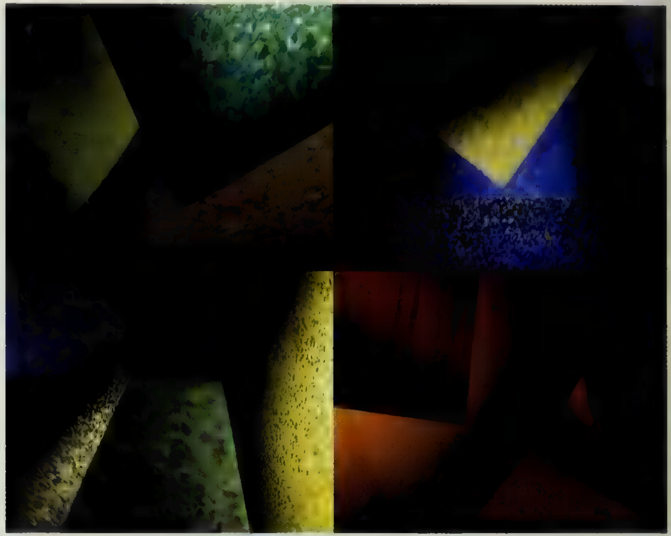
### ▼ Retractable awnings

The retractable awning shown here combines Sunbrella fabric and a Somfy electric motor. Awning fabrics, available in more than 100 solids and stripes, are woven from 100 percent solution-dyed acrylic yarns. Backed by a five-year warranty. 800/441-5118. Sunbrella, Glen Raven, N.C. **CIRCLE 240**

### ► Custom inlay



VT Industries uses one of three processes to create custom inlay laminate doors: seamless inlay, silk-screen, or graphic imaging. Company logos and original artwork may be incorporated into the design. 800/827-1615. VT, Holstein, Iowa. **CIRCLE 242**



### ▲ Sheet vinyl flooring

The Constellation series of sheet vinyl flooring, manufactured by LM Chem and distributed by the International Commercial Flooring Systems company, includes the Ara, Lyra, Columba, and Vela collections, with patterns resembling wood, marble, and terrazzo. The entire collection is backed by a five-year warranty. 888/306-5532. International Commercial Flooring Systems, San Francisco. **CIRCLE 241**

### ► Acoustical ceiling batts

Johns Manville's commercial insulation division offers Grid-SHIELD Rx, formaldehyde-free, poly-encapsulated thermal and acoustical ceiling batts. These batts, designed for suspended-ceiling systems, resist heat transfer and absorb sound. 303/978-2000. Johns Manville, Denver. **CIRCLE 243**

### ▼ Water damage control

USG answers the ongoing debate over barrier EIFS with two new products: Insulscreen 2000 and Duroscreen 1000, water-managed synthetic stucco systems that avoid the moisture intrusion problems that have occurred on some of the barrier EIFS-clad homes. Shown left is a close-up detail of a home with moisture damage resulting from the use of a barrier synthetic stucco system. Shown right is another home clad with USG's watertight Insulscreen 2000 system. 800-USG-4YOU. USG, Chicago. **CIRCLE 245**

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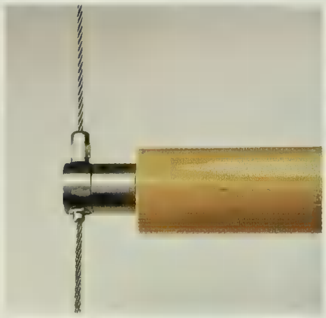
## PRODUCTBRIEFS

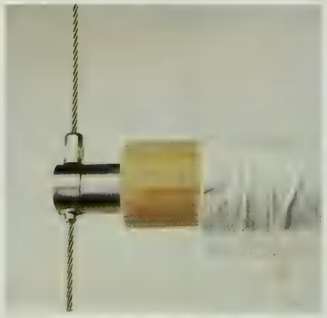
**▼ Convection ovens**

The latest cooking trend is professional-style convection ovens for the home. A recent joint venture between oven manufacturer Thermador and the food industry's research and development center, Enersyst, has resulted in JetDirect ovens. Available with a black, white, or stainless-steel finish, JetDirect ovens direct jets of air directly into the food being cooked rather than into the oven cavity randomly. 714/901-6600. Thermador, Huntington Beach, Calif. **CIRCLE 252**

**▼ No more nails**

The Arakawa Art Clair Rail system, a ceiling-mounted art-hanging system, is available in two-, three-, and six-foot lengths. Banner and picture hooks are available. The system is specially designed for hanging artwork, fixtures and shelves, and signs and banners, and for suspending lights. Clips can be attached and moved horizontally along the rails. 888/ARAKAWA. Arakawa, Portland, Oreg. **CIRCLE 247**





**▶ Sealing the deal**

3M FireDam Spray is a water-based coating alternative to firestop caulk. It is applied with an airless sprayer as a ⅛-inch-thick coating to perimeter joints between fire-rated floors (concrete or fluted-steel decks) and walls (gypsum or concrete). 800/328-1687. 3M, St. Paul, Minn. **CIRCLE 246**

**▲ Covering new heights**

The Wilsonart Wall System for shower and tub surrounds consists of a 5-by-12-foot sheet of Wilsonart laminate or SSV solid surfacing with a crystal or matte finish bent at a 90-degree angle for a custom fit. 800/433-3222. Wilsonart, Temple, Tex. **CIRCLE 248**

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## PRODUCTBRIEFS

**▼ Historically inspired**

At the Chicago Decorex show last June, David C. Bishop designed an English-inspired conservatory with Marvin Windows and an aluminum roof. Bishop has been designing and installing such conservatories since 1988. 800/729-7259. David C. Bishop, Glenview, Ill. **CIRCLE 249**

**► Thermal protection**

Dow's Styrofoam Cavitymate Plus has a high compressive strength and R-value. Cavitymate Ultra offers an insulation value at least 12 percent higher than standard 1½- and 2-inch-thick Styrofoam. 800/441-4369. Dow Chemical, Midland, Mich. **CIRCLE 253**

**▲ Pipe protection**

Handy Shield vinyl safety covers from Plumberex Specialty Products are made of closed-cell foam with Velcro sealing strips. The internal foam lining eliminates sharp or abrasive surfaces and meets ASTM standards D-1667 and D-395. Available in eight colors, Handy Shield meets ADA standards and includes covers for p-traps, valves and supplies, and wheelchair/offset tailpieces. Eastern United States: 800/241-5236. Western United States: 800/475-8629. Plumberex Specialty Products, Palm Springs, Calif. **CIRCLE 251**

**▼ Window wonder**

The Series TR-400 casement and projected window from Traco features a beveled vent exterior. The window has a 3¼-inch-deep master frame, ⅛-inch walls, and dual hollow extrusions in both the master frame and the vent. The TR-400 also has an option for a 4½-inch frame. 724/776-7000. Traco, Pittsburgh. **CIRCLE 250**

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## PRODUCT LITERATURE

**Marlite on CD-ROM**

A copy of the Marlite Web site, including product information, is available on CD-ROM. Several CAD drawings are included. AutoCAD users can select files in DWG format; DWF files are also available. Web access is not necessary for viewing. 330/343-6621. Marlite, Dover, Ohio. **CIRCLE 261**

**Lamp poles**

W. J. Whatley's new brochure offers architects, engineers, and developers information on how to specify ornamental lighting poles. It also includes information on the company's Web site, which allows users to download post designs and draw them to scale. 303/287-8053. W. J. Whatley, Commerce City, Colo. **CIRCLE 262**

**Energy efficiency**

A brochure on energy-efficient lighting products for both residential and commercial spaces, some of which are certified by the Energy Star Program, is now available from Progress Lighting. 864/599-6000. Progress Lighting, Spartanburg, S.C. **CIRCLE 263**

**Color forecast**

The 17th edition of the DuPont interior color and design forecast, called Global Language, helps specifiers understand carpet color trends. 800/4DUPONT. DuPont, Atlanta. **CIRCLE 264**

**Fiber optics**

Lumenyte's photometric specification sheets provide information on the company's line of fiber-optic products. 949/829-5200. Lumenyte, Irvine, Calif. **CIRCLE 265**

**Isolation equipment**

A new brochure from Greenheck, "Mounting Bases and Vibration Isolation," outlines the different types of bases and isolators that are available for use with both utility and centrifugal fans. 715/359-6171. Greenheck, Schofield, Wisc. **CIRCLE 266**

**Distributor news**

Angelo Brothers will distribute Westinghouse's new product line, which is outlined in a series of brochures featuring MarineLite, ReaLite, NurtureLite, and ReptileLite. 888/417-6222. Angelo Brothers, Philadelphia. **CIRCLE 267**

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## PRODUCT LITERATURE

### Duplex systems

The American Galvanizers Association (AGA) has a new brochure describing duplex systems for painting over hot-dipped, galvanized steel. 800/HOT-SPEC. AGA, Aurora, Colo. **CIRCLE 254**

### Tile and stone installation

"Making Masterful Designs a Lasting Reality" is the theme of a new brochure from Custom Building Products. 800/272-8786. Custom Building Products, Seal Beach, Calif. **CIRCLE 255**

### Lighting design software

LitePro for Windows 95 and NT is software for both indoor and outdoor lighting applications that produces 3-D color renderings. Designers can also import and export 2-D DXF files between CAD and LitePro. 509/924-7000. Columbia Lighting, Spokane, Wash. **CIRCLE 256**

### The doors

Simpson's new brochure features the Mastermark collection of exterior and interior wood doors as well as the Designer, Advent, Selects, and Builder's Advantage series. 800/952-4057. Simpson, Federal Way, Wash. **CIRCLE 257**

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| ImproveNet | **www.improvenet.com** |

### Finned-tube heating

A brochure on classically designed finned-tube heating enclosures by Sterling includes information on clear anodized aluminum grilles. 413/568-9571. Sterling, Westfield, Mass. **CIRCLE 258**

### Terrazzo designs

Manhattan American Terrazzo Strip has compiled a collection of new terrazzo flooring designs. 773/471-0700. Terrazzo and Marble Supply, Chicago. **CIRCLE 259**

### Concrete repair

Master Builders' brochure offers information on concrete repair and protection issues in industrial, civil, and commercial building. 216/831-5500. Master Builders, Cleveland. **CIRCLE 260**

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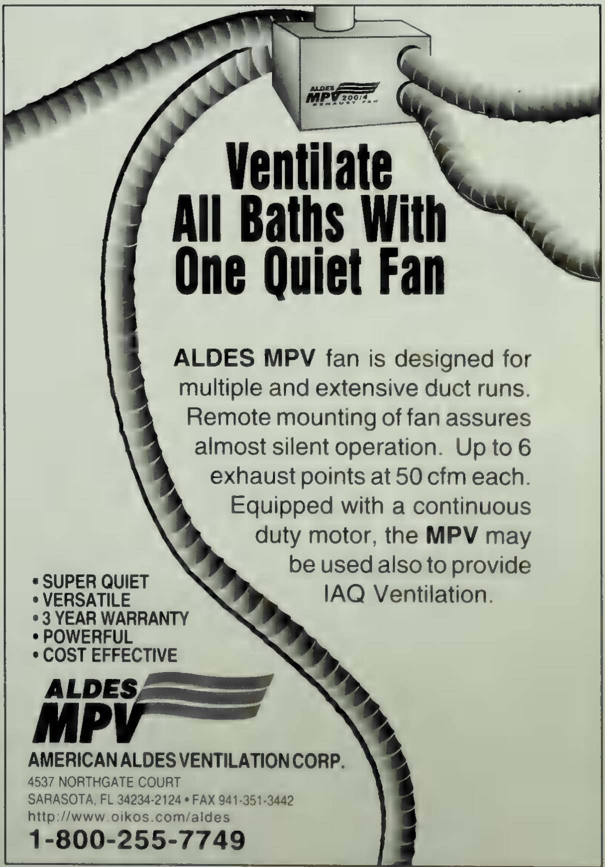

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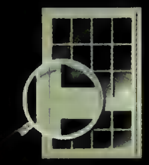

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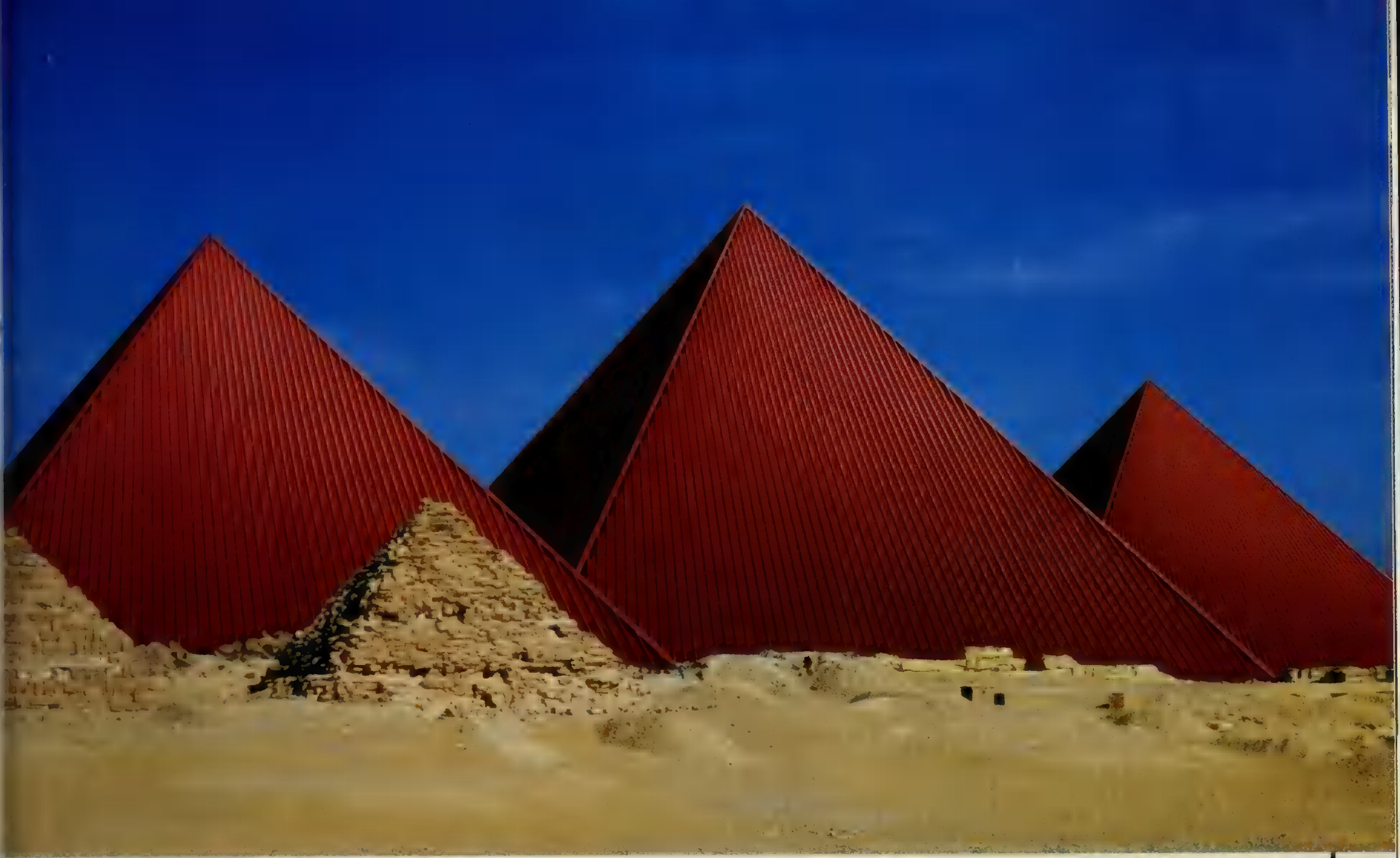

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The Institute

(continued from page 33)

Hoover Dam, San Francisco's rapid transit system, and the Channel Tunnel. National Building Museum. 202/272-2448.

**Marion Mahony and Walter Burley Griffin in America, Australia, and India**
**Sydney, Australia**
*Through May 2, 1999*
This exhibition explores the professional and spiritual journey of architects Mahony and Griffin, from their years in Frank Lloyd Wright's office at the turn of the century through their work in Australia and India in the 1920s and 1930s. Powerhouse Museum. 011/61/02/217-0111.

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**DOCOMOMO Conference**
**Stockholm**
*September 16–18*
This year's conference of the International Working Party for the Documentation and Conservation of Buildings, Sites, and Neighborhoods of the Modern Movement focuses on the social aspects of modern architecture and urban planning. An international docket of speakers will be presenting papers. Swedish Museum of Architecture. E-mail marina.botta@arkitekturmuseet.se for more information.

## Competitions

**American Institute of Architects New York Chapter Annual Design Awards Program**
*Entry form and fee deadline: August 19*
*Submission deadline: September 9*
Licensed architects practicing in New York City are eligible for the AIA NYC Awards Program. Submissions can be entered in three categories: built work, interiors, and projects. Call the AIA NYC at 212/683-0023 for more information.

**Membrane Design Competition**
*Submission deadline: September 2*
This year's Membrane Design Competition, sponsored by Taiyokogyo Corporation, honors the creative design of airport structures using membrane. Write Membrane Design Competition, 4-8-4 Kigawa-higashi, Yodogawa-ku, Osaka 532-0012, Japan; fax 011/81/6/306-3154; or E-mail mh_001600@fc.taiyokogyo.co.jp.

**Shinkenchiku Residential Competition**
*Submission deadline: September 10*
Kyoto architect Shin Takamatsu will judge this year's ideas competition, sponsored by *Japan Architect* magazine. Winners' work will be published in the December 1998 issue of *JA*. To receive a copy of the rules, fax a request to 011/81/3/3811-0243.

**AIA Continental Europe Design Awards**
*Submission deadline: September 11*
Eligible projects are those built on the European continent and completed after January 1, 1993. For submission information, contact Frimmel Smith at frimmel@compuserve.com.

**Union Internationale des Architectes Student Competition**
*Registration deadline: September 15*
*Submission deadline: January 31, 1999*
Student entrants are invited to design a housing project for a city in their home country. In addition to cash, the winner will receive the UNESCO Prize for Architecture. To register, call Liu Kecheng at Xi'an University, in Xi'an, China, 011/86/29/220-29-43, fax 011/86/29/552-78-21, or E-mail LiuKCH@pub.online.xa.sn.cn.

**Design a Conservatory, Win a Conservatory**
*Submission deadline: October 26*
Sponsored by David C. Bishop and Co., this contest focuses on a garden room theme, including the creative use of furnishings in both the interior and exterior landscape. The winner will receive a freestanding 12-foot octogonal conservatory created for this event. Call the Merchandise Mart at 847/729-9812 or visit www.conservatories.net.

**Rudy Bruner Award for Urban Excellence**
*Submission deadline: December 18*
This award is given to urban places that demonstrate a successful integration of effective processes and meaningful values into good design. The Gold Medal winner receives $50,000; each silver medalist receives $10,000. For more information or an application, call 617/492-8401 or E-mail info@brunerfoundation.com. ■

*Please submit information for events and competitions at least six weeks prior to the magazine's publication date (e.g., September 15 for the November issue).*

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## AIA / ARCHITECTURAL RECORD CONTINUING EDUCATION

### Instructions

- Read the article "Improving Glass Performance" (page 131) using the learning objectives provided.
- Complete the questions below, then check your answers (page 198).
- Fill out and submit the self-report form (page 198) to receive two AIA Learning Units.

### Questions

**1.** What can be added to glass to change its color?

**2.** Discuss how glass is tempered and the physical properties that tempering changes. What other techniques can be used to strengthen glass?

**3.** Describe how glass is made stronger for security applications.

**4.** Explain what low-emissivity coatings do for glass and how they are applied.

**5.** Describe how glass can be made to absorb or reflect heat and glare.

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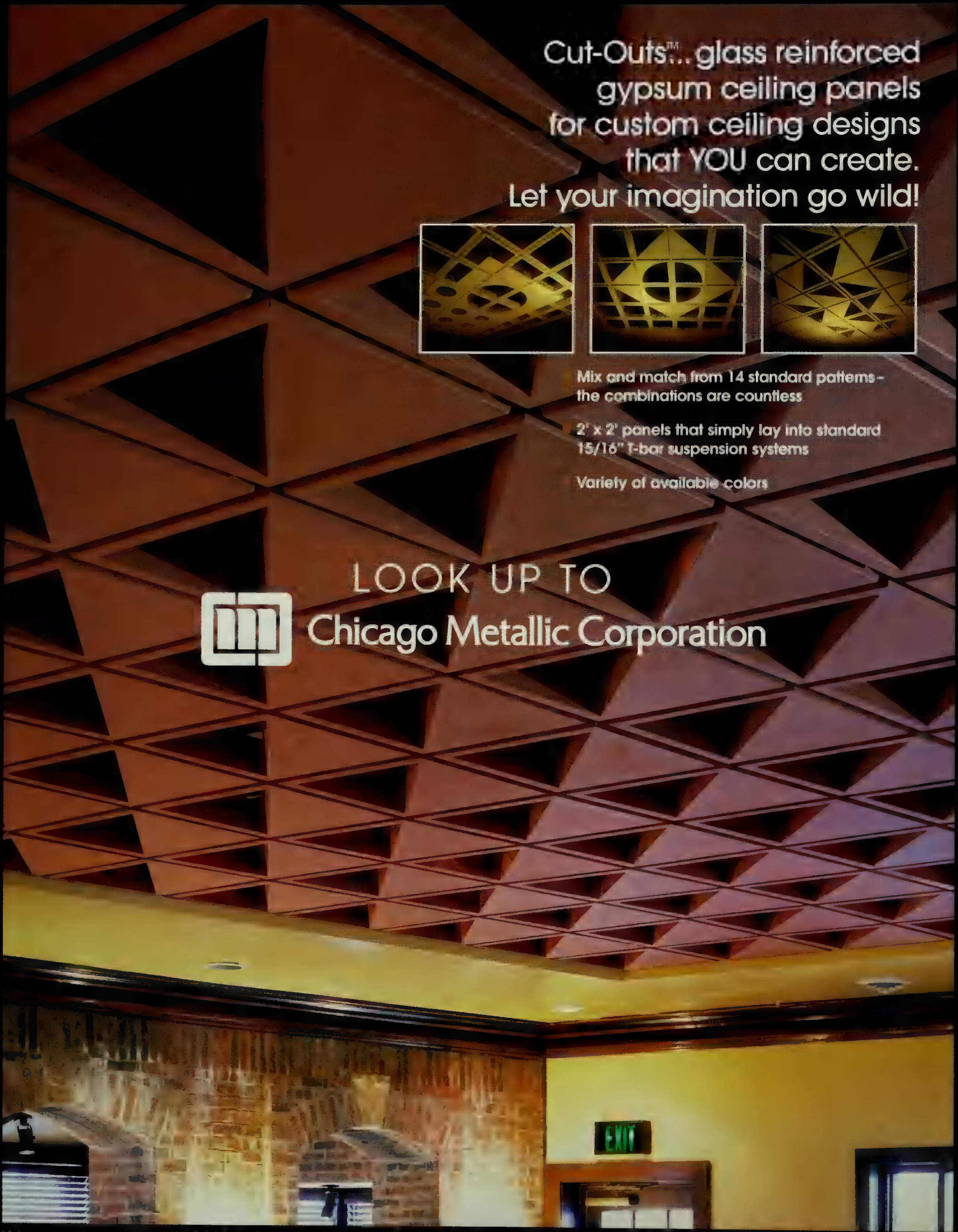

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### ANSWERS

Questions appear on page 196. To receive CES credits, fill in the self-report form below.

**1.** Minerals are added to silica to change the color. Cobalt oxide makes glass turn blue. Adding iron gives glass an aquamarine cast. Cobalt and nickel together make the glass colorless. Phosphorus makes glass opalescent.

**2.** Glass can be made from two to six times stronger, as well as less brittle and more resistant to fracture from temperature extremes, by reheating it and then quickly chilling it. Manufacturers make glass stronger by mixing more iron into the silica. Glass can also be chemically strengthened, making it suitable for use as paving or flooring. Laminated or safety glass is also stronger than untreated material.

**3.** For security purposes, there's little substitute for glass thickness, though manufacturers are striving to make glass lighter and more transparent. Glass is made stronger by sandwiching plastic, usually polyvinyl butyral (PVB), between layers of glass. PVB is valued for its affordability and transparency, though many companies are working to develop new and stronger interlayers. Laminated glass is used to resist storm damage, break-ins, bombings, and fire. The addition of plastic layers to glass also reduces sound transmission. Bulletproof glass is usually made by adding layers of polycarbonate. New generations of bulletproof glass are designed to look like standard architectural glass.

**4.** Low-e films boost the energy efficiency of glass by reflecting radiant heat. In the summer, solar gain is reflected outdoors; in the winter, heat is reflected back into a living space. New spectrally selective coatings, now integrated into low-e films, increase the efficiency of glass by screening out certain types of solar waves while maximizing daylight. As a result, architects can increase the amount of glass that is permitted by code within a building. Microscopic layers of metal oxides are applied either by sputtering or pyrolitically. Sputtering ionizes metal and then deposits it in a thin film onto glass or plastic. This is ideal for glass that is laminated or has some other type of coating because it is a low-temperature process. The problem with sputtering is that because the coating lies on top of the glass, the metals can be scratched or damaged. The pyrolytic process deposits tin oxide on glass while it is still molten. The result is a low-e coating that is integral to the glass and thereby less likely to be damaged.

**5.** Glass can be made more heat absorptive by mixing in an additive, usually cerium oxide, which increases its absorption. Colored glass will absorb sunlight from across the spectrum. Glass can be made to reflect heat by adding a low-e or spectrally selective coating. Specifying reflective glass will also block solar gain and provide privacy for the occupants, but daylight is sacrificed. It is possible to reduce glare by specifying glass that is fritted, sandblasted, acid-etched, or textured. Fritted glass is the least expensive and the most easily obtainable of these options. Its slick surface also makes it easy to maintain.

## AIA/CES SELF-REPORT FORM

*(Use to report learning units earned for ARCHITECTURAL RECORD only.)*

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☐ "Improving Glass Performance" (page 131)
*Completion date (M/D/Y):* _______ / _______ / _______

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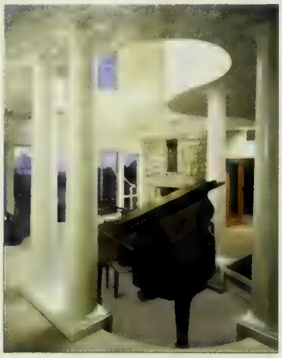

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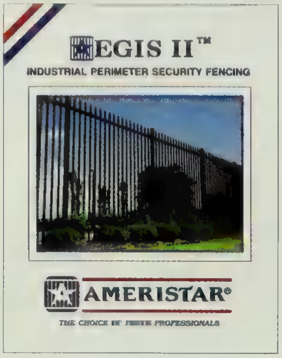

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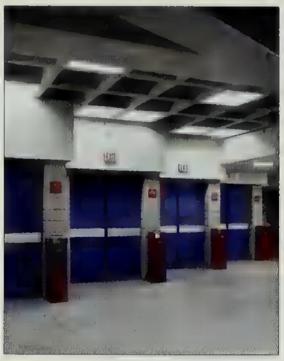

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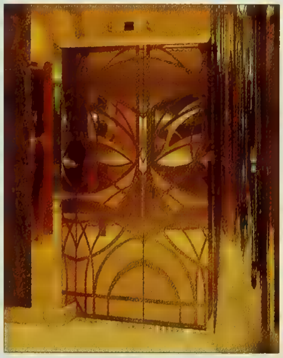

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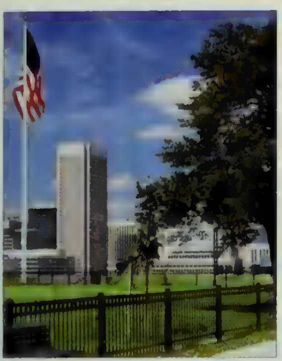

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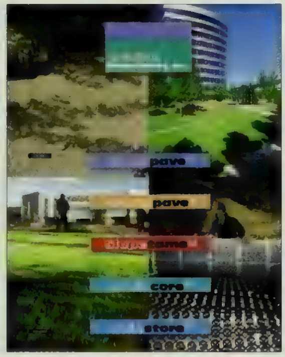

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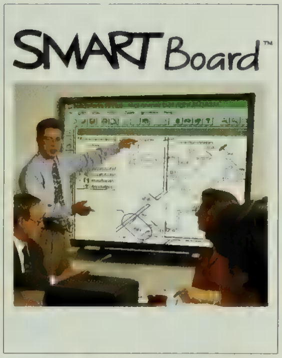

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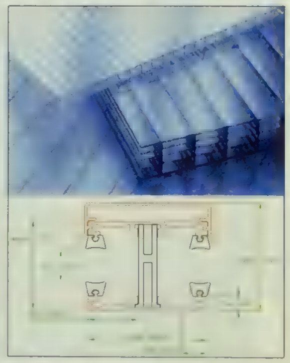

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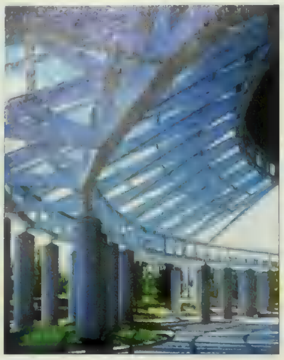

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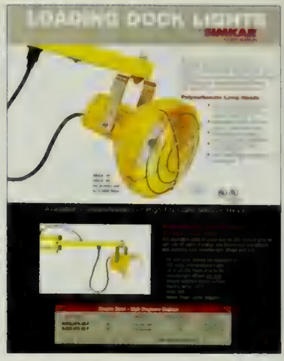

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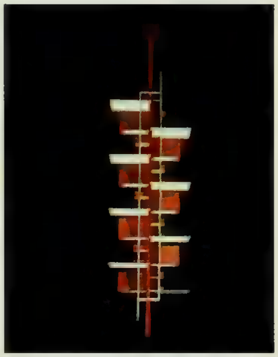

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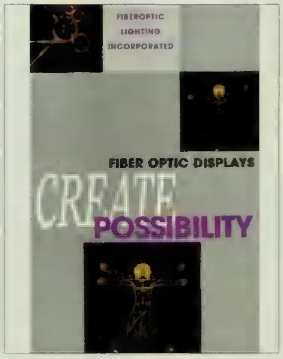

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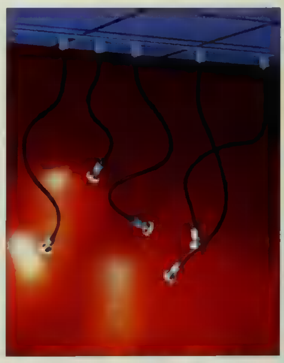

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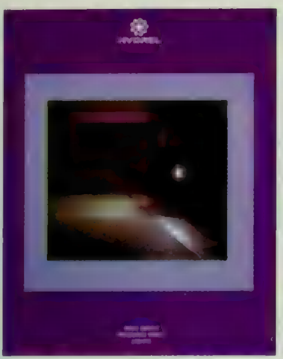

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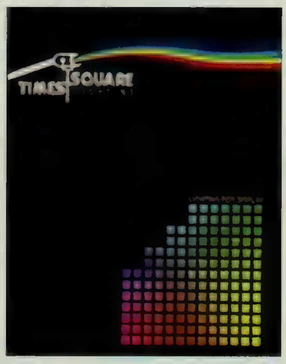

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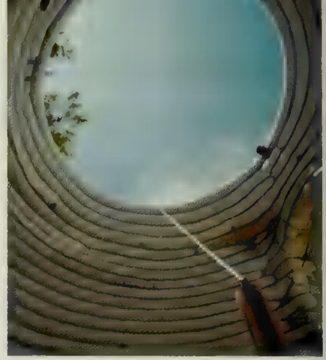
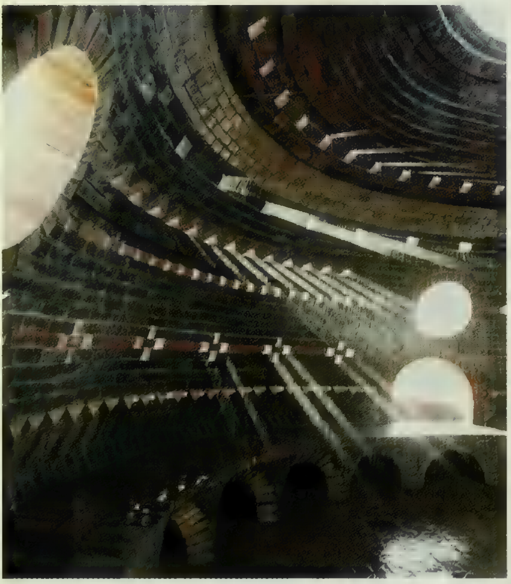
# THE FUTURE An architect is devising new processes for building dirt-cheap houses from elemental materials.



BY TED KATAUSKAS

A growing number of apprentice home builders are traveling deep into the California desert for a chance to commune with Nader Khalili, an architect who is trying to wean the world off of two-by-fours, steel, and concrete. "We send our children into the world with the notion that a house must have a pitched roof, a square window, and a chimney," Khalili says. "How can they imagine they can build something beautiful out of dirt?"

At the California Institute of Earth Art and Architecture, a school Khalili founded in the Mojave Desert seven years ago, the 61-year-old architect from Teheran is helping his students, who typically have no architectural training, do just that. During a week-long workshop, they learn how to build homes from only the most elemental materials—earth, water, and fire. The designs range from sandbag igloos to vaulted adobe structures that are glazed and fired into ceramic.



**The Khalili-designed Rumi Dome (above), made of fired brick, and a superadobe structure (top).**

Khalili's unique vision emerged out of a midlife crisis. In 1975 a 38-year-old Khalili was heading a Teheran firm prospering in the midst of Iran's modernization. Realizing that his profits were coming at the expense of traditional Persian architecture, which was being replaced with steel and concrete, Khalili sold his stake in the firm, bought a motorcycle, and took off on a five-year odyssey through the Iranian desert, searching for a way to preserve his country's architectural heritage while housing the poor.

On the outskirts of Ghaleh Mofid, a remote desert village, Khalili found the solution: a house-sized kiln that was once used to fire clay tiles. Inspecting the abandoned structure, he noticed that in the course of countless firings, the adobe blocks used in the kiln's walls and ceiling had fused together, forming a solid ceramic shell that had withstood earthquakes and the elements.

Within the walls of Ghaleh Mofid, he found villagers living in the open air because the vaulted roofs of their crumbling unfired adobe brick homes had been weakened by rain. Khalili convinced the villagers that he knew of a simple way to turn their unstable homes into sturdy structures. As a test, he repaired a single two-room house. Temporarily sealing its door and windows with bricks, Khalili fired the house from the inside, with a burner gravity-fed by two barrels of kerosene balanced on the roof. The house baked for 17 hours, until the adobe blocks had melted into a shell of earthquake-resistant and rainproof brick, just like the kiln. Soon, every home in the village had been fired. Over the next few years, Khalili toured the farthest reaches of Iran, teaching villagers how to transform their homes into ceramic, a process he called *geltaftan,* a combination of the Persian words for clay and firing.

In 1982 Khalili began teaching a course in ceramic architecture at the Southern California Institute of Architecture. On a field trip to New Mexico, looking for adobe houses to fire, Khalili discovered that unlike Iranian peasants, America's poor lived in trailer homes. Adobe houses built with bricks that cost a dollar apiece were not an option.

"I needed to find a way to pick up soil and build with that, taking into account those who cannot afford clay or firing," Khalili explains. "Then I realized that all over the world there is sand, but nobody is doing anything with it."

So Khalili figured out how to make houses out of sand. Using a mortar of barbed wire, he stacked sandbags into arches and staggered the arches into vaults, forming a sort of igloo that required a total material investment of only a few hundred dollars. For those who could not afford their pitched-roof dream house but preferred something a bit more refined than a sand castle, Khalili developed superadobe, mile-long fabric tubes that are pumped full of moistened soil and coiled into structures resembling beehives. These middle-class superadobe houses cost about as much as a 10-year-old compact car.

Khalili still teaches architecture students in Santa Monica, but he spends most of his time at the school he founded, fielding questions from would-be home designers who have never used a drafting table.

Ultimately, he envisions an earth-friendly Levittown rising out of the Mojave. This summer, Khalili and his students will build a model superadobe home on undeveloped acreage near his school in Hesperia, a bedroom community of pitched-roof bungalows. He then hopes to convince 40 Hesperians to replicate his design—which doesn't seem unlikely, given that the town has commissioned a 7,500-square-foot nature center/museum.

While Hesperia's leaders are quick to compare Khalili with Frank Lloyd Wright or Buckminster Fuller, the architect himself prefers to be measured against an apricot. "Some of my best inspiration comes from the apricot pit," he says. "You put it into the earth, and that pit changes the earth into a tree with branches that flower and make more apricots. That is a true architect." ■

*Ted Katauskas is a freelance writer based in Portland, Oregon.*

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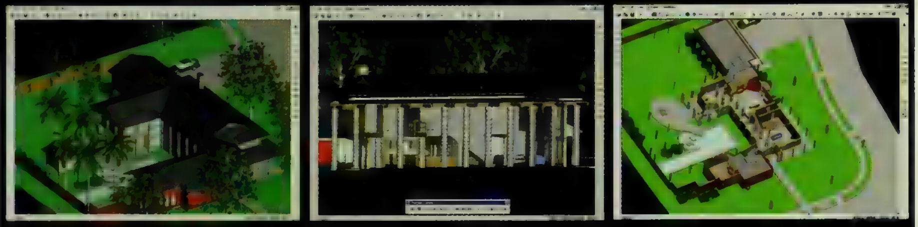

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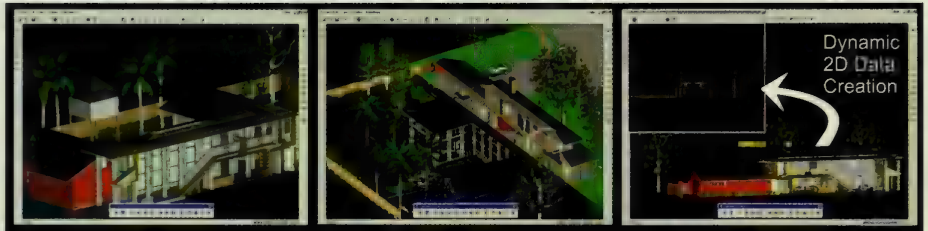

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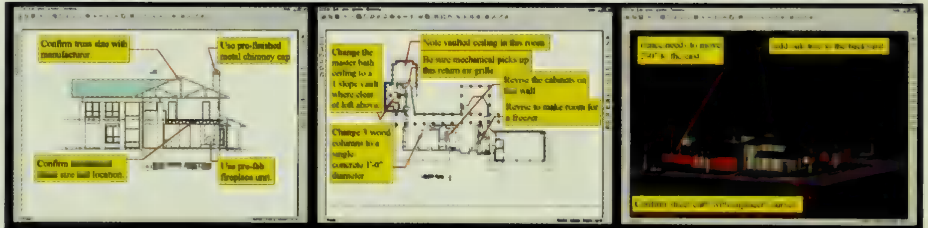

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